ISSN: 0794-9316 Volume 6, Number 1, March 2010

NIGERIAN JOURNAL OF PLASTIC SURGERY

NJPS

JOURNAL OF THE NIGERIAN ASSOCIATION OF PLASTIC, RECONSTRUCTIVE AND AESTHETIC SURGEONS and of THE NIGERIAN BURN SOCIETY

ISSN: 0794 -9316 **Volume 6, Number 1, March, 2010**

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A publication of **THE NIGERIAN ASSOCIATION OF PLASTIC, RECONSTRUCTIVE AND AESTHETIC SURGEONS** and of the NIGERIAN BURN SOCIETY

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Instruction to authors

The *Nigerian Journal of Plastic Surgery* is the official Journal of the Nigerian Association of Plastic Reconstructive and Aesthetic Surgeons and also of the Nigerian Burn Society. Its object is to publish original articles about developments in all areas related to plastic and reconstructive surgery as well to burn trauma and to provide a forum for correspondence, information and discussion. It is a peer review journal. All correspondence should be sent to
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Acknowledgements
May be placed at the end of the main text and before the references. You may acknowledge technical help in carrying out a study but not in preparation of a manuscript. Give details of any funding or other support for the study.

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1. Gana J.Y, Olawoye O.A, Ademola S.A, Ndili O. Complications of Free Tissue Transfer. The Ibadan Surgeon 2002; 28: 4 – 14.
2. Lemke BN Kikkawa DO. Repair of orbital floor fractures with hydroxyapatite block scaffolding. Ophthalmic Plastic and Reconstructive Surgery. 1999; 15: 161-165.
3. Laxenaire A Levy J Blanchard P Lerondeau JC Tesnier F Scheffer P. Silastic implants and reconstruction of orbital floor: a review of 20 years experience (French). Annals de Chirurgie Plastique et esthetique 1996; 41: 631-638.
4. Ladipo JK. Laparoscopic Surgery. In: Badoe EA, Archampong EQ and da Rocha-Afodu JT, eds. Principles and Practice of Surgery including Pathology in the Tropics, 3rd edition. Tema, Ghana: Ghana Publishing Corporation Publishers; 514 pages.

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ERRATA

In abstracts 9 and 40 on pages 49 and 57 respectively in the last edition, volume 5; 2 of September 2009, of the journal, the names of the authors were avoidably omitted. The titles should therefore have read as follows:

For abstract 9: Experience with post trauma lower extremity reconstruction at National Orthopaedic Hospital, Igbobi, Lagos. Chira MK, Akindipe J, Ezeah IK.

And for abstract 40: Surgery for spinal injury pressure sores - Experience in a spinal rehabilitation unit. Chira MK, Akindipe J, Ezeah IK.

Incidence of breast developmental anomalies: a study at Sogakope, Ghana

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Date submitted: 30 Nov 2009 *Accepted for publication: 7 Jan 2010*

SUMMARY

Background: Issues of breast developmental anomalies (BDA) among young females in Sogakope have not been given proper attention due to their ignorance of available treatments. The objective of this study was to identify the most common forms and incidence of BDA among female Junior High School (JHS) students.

Method: It was a prospective descriptive study at six selected JHS at Sogakope, South Tongu District Assembly of the Volta Region, Ghana. Clinical Breast Examination (CBE) was performed on both breasts of female JHS students and anonymous pretested questionnaires were administered to those found to have BDA. Demographic and BDA data were recorded and correlated from March 30 – 31, 2006.

Result: A total of 550 female students were surveyed, with age between 10 and 22 years. Seventy of them (12.7%) had BDA. Among these, 98.6% had not sought medical attention for their BDA while 80.0% would seek medical treatment for their conditions if it were readily available. Also, 37.1% of the respondents noticed BDA one year prior to the survey. The three most common form of BDA identified were macromastia (40.0%), hypomastia (17.1%) and nipple anomalies (14.3%).

Conclusion: The incidence of BDA among the junior high school females in Sogakope is high. Macromastia is the most common form of BDA identified. Prompt education on availability of treatment should be encouraged with emphasis on aesthetic plastic surgery.

KEYWORDS: Breast developmental anomalies, Clinical breast examination, Junior High School students, Sogakope.

Introduction

Attractive breasts are symmetrically situated on the antero-lateral chest wall and have soft but defined junctures with the chest, upper abdomen and the axillae. The breast profile is a gentle downward vertical flow from the clavicle to the nipple-areola and forms a mildly convex curve from the nipple-areola to the infra-mammary crease[1]. Budding of the breasts (thelarche), usually occurs at approximately age 10-11 years. Full breast

maturity can be as short as 18 months and as long as nine years. Various breast anomalies, such as athelia (absence of nipples) and amastia (absence of breast tissue) could be genetic and may occur during the breast developmental period[2,3]. Normal size, shape or symmetry of female breast, plays important role on the beauty of the female and cultural values in any society.

This study was designed to identify the forms and incidence of BDAs at Sogakope, the district capital of the South Tongu District Assembly, which is located in the southern part of Ghana, and to create a database for BDAs, which could be utilized to compare future studies in the central and northern parts of Ghana.

Materials and method

From March 30 – 31, 2006, a 10 member research team made up of two doctors – a consultant plastic surgeon and a general practitioner, four nurses, two biostatisticians, one health educator and one social worker, selected six JHS at Sogakope to detect any BDA among the female students. A total of 550 respondents were taken through Clinical Breast Examination (CBE) conducted by the trained doctors and nurses who were distributed in the three sub-teams formed for the survey. Seventy (12.7%) of the subjects were diagnosed with BDA. These had anonymous pretested questionnaires administered to them. They were taken through the questionnaires, using simple English or in their indigenous language so as to obtain all required information for the study. The demography and history of relatives of respondents were also acquired. Descriptive analysis was performed on the information obtained. A clinical breast examination was reported as normal when no abnormal findings were noted after observation and palpation of the breasts, the axillae, the supra and infra clavicular fossae and the trunk.

Results

Five hundred and fifty female students were taken through CBE, with age range between 10 to 22 years (figure 1), distributed in various classes (figure 2). Out of the total, a BDA incidence of 12.7% (i.e. BDA: normal breast ratio was 1:8) was recorded, figure 3.

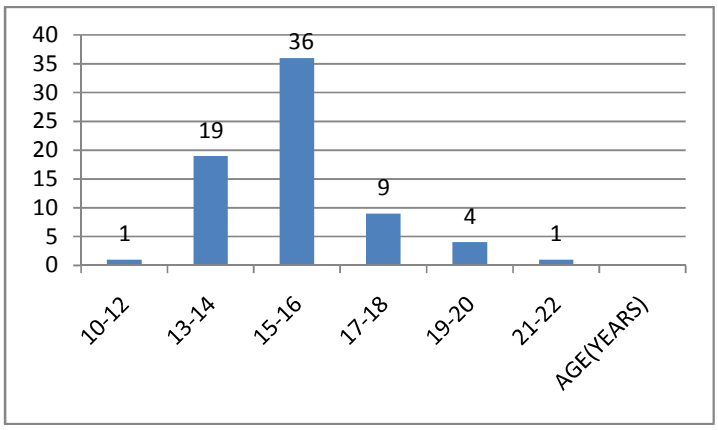


Figure 1: Age distribution of the JHS female students in the study

The three most common forms of BDA identified were macromastia (40.0%), hypomastia (17.1%) and nipple anomalies (14.3%). Others were accessory breast (11.4%), tubular breast (10%) and aplasia (7.1%). More than half of the respondents (57.1%) had no problem with their BDAs, 20% noticed pain, 10% were conscious of the weight and large size of the breasts and 8.6% had pruritus/heat. In addition, 37.1% of the respondents noticed their BDA one year prior to the study, while 18.6% could not remember the exact period they noticed theirs.

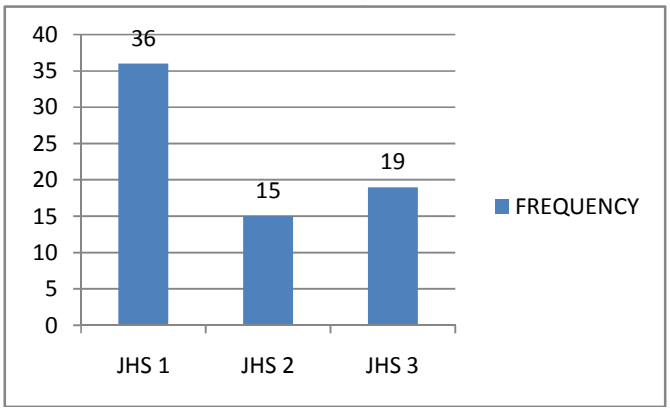
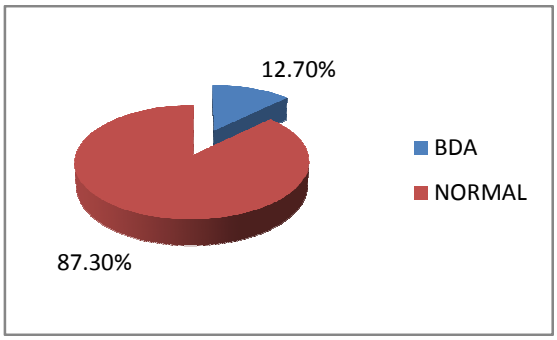


Figure 2: Class distribution of the JHS female students in the study

Figure 3: Incidence of BDA among the female JHS students

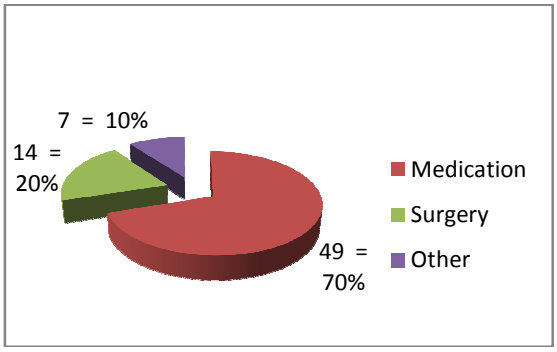


It was recorded that 98.6% of the respondents had not sought medical attention; 8.6% had financial constraint and 2.9% did not know where to go for treatment; only one respondent sought medical treatment, table 1. The study also recorded that 49 (70%) of the respondents were ready to accept medication for the treatment of the BDA, 14 (20%) were ready for surgery and 7 (10%) would accept other forms of treatment, including counselling and regular reviews, figure 4.

Table 1: Reasons why respondents did not seek medical attention

Reason	**Frequency**	**Percent (%)**
No response	9	12.8
The size is not big hence no problem	16	22.9
Not aware of the anomaly problem	34	48.6
Don't know where it is treated	2	2.9
Financial constraint	6	8.6
Have not shown it to parents	3	4.3
Sought medical attention	1	1.4
Total	**70**	**100.0**

Figure 4: Type of treatment respondents would accept



Discussion

When a woman presents to her health care provider with a breast symptom, the initial management will nearly always include, at a minimum, a clinical breast examination (CBE) and mammography or ultrasound imaging, depending on the age of the patient. Breast diseases such as cancer are rare in the adolescent girls. However, these girls are prone to BDAs. Since BDAs are painless and since scientific information and education on it are inadequate, it is difficult for the adolescent girl to know that her breast development is not normal[4]. In a retrospective study in Kumasi, Ghana (2007), thirty-eight cases of BDA were recorded, of which macromastia (oversized breasts) was 47.37% of the total BDA cases[4].

Other studies confirmed polythelia (extra nipple) and breast asymmetry as the most common forms of BDAs[5]. Breast asymmetry may develop as thelarche ensues. In this condition, one breast may develop before or more rapidly than the other. The physical examination findings usually include homogenous enlargement of one breast with no discrete masses or discharge. Accompanying breast tenderness may be present if the breast bud is starting to develop. An extra breast (polymastia) or extra nipple (polythelia) occurs in approximately 1% of the population. It may be an inheritable condition. Extra breasts or nipples most commonly occur along the milk line; however they have also been noted in ectopic sites such as the back or buttocks. These accessory breast tissues respond to hormonal stimulation and may cause discomfort during menstrual cycles. The accessory breast tissues have also been reported to undergo malignant transformation and should be removed[6].

Aesthetic surgical intervention for anomalies should be tailored and timed to the individual patient's situation and does not need to wait until after adolescence. Though aesthetic surgery is the reliable type of treatment for most BDAs[7,8,9], majority of the respondents, would prefer to seek medication as a type of treatment for their BDA.

Breast symptoms are evaluated initially by clinical breast examination and imaging study, with supplemental studies when the diagnosis is unclear[10]. Clearly, breast disease is a major concern for women, and it has a substantial effect on both individual and societal health care resources. Though BDAs are uncommon as compared to traditional breast diseases such as breast cancer and lumps, in the study, it was found that, by clinical breast examination, 12.7% of the girls were diagnosed to have BDA (i.e. BDA : normal breast ratio = 1:8). In a retrospective study in Komfo Anokye Teaching Hospital (KATH), Kumasi 38 cases of BDA were recorded from 1997 to 2000[4]. This study recorded a higher number of BDAs compared to that of KATH and suggests that the young females in the locality, who very soon will be the reproductive and labour force of the communities, are in need of extensive education on BDA and other breast diseases.

Haagensen also reported that, an extra breast or an extra nipple occurs in approximately 1% of the population and it may be an inheritable condition[2]. KATH's study and ours recorded macromastia as the most common form of BDA. The high number of macromastia may be a result of hereditary or increased hormonal secretion, since majority of the respondents are in their adolescent stages.

Conclusion

The incidence of BDA among the junior high school females in Sogakope is high with a 1:8 ratio of BDA to normal breasts. Macromastia is the most common form of BDA identified. Prompt education on availability of treatment should be encouraged with emphasis on aesthetic plastic surgery.

Acknowledgement

We sincerely thank the South Tongu District Assembly Directorate of Ghana Education Service for permitting us to conduct this survey in their district. We also thank the young ladies and their parents for given their consents to the study. We specially want to commend the schools' head teachers and their staffs for controlling the girls in an orderly manner which enabled us to run a very smooth programme.

We also wish to thank the Management of the South Tongu District Hospital, Sogakope, for allowing us to perform free surgeries on some of the subjects during the surgical outreach visits that followed the survey.

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Vacuum assisted closure of wounds – a review

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Submitted: 27 November 2009 *Accepted for publication: 6 January 2010*

Summary

Background: Vacuum-assisted closure (VAC) therapy is a new technique based on the principle of application of controlled negative pressure. This technique has revolutionized the concept of wound management in recent times.

Method: This is a review article in which various aspects related to the use of VAC therapy are dealt with.

Key words: Vacuum Assisted Closure (VAC), dressings, wound, negative pressure.

Introduction

Since creation, man has been struggling to treat the wounds inflicted by his fellowmen and by nature. In this struggle, various means of wound closure evolved. Use of Vacuum Assisted Closure (VAC) in wound management is a recent and significant addition to the armamentarium of wound management. This method works on the controlled application of negative pressure over the wound bed. This concept of using vacuum for treating wounds was first described by Fleischmann *et al* in 1993[1] when they published the successful results of this technique in 15 patients with open fractures. They found this method to efficiently clean the wound and induce the marked proliferation of granulation tissue with no residual bony infections. Over the period of the next five years, they published two additional papers on the success of vacuum application[2] and these were followed by publications by workers from other recognized centers[3,4], thereby giving recognition to vacuum as a viable option in wound care.

Mechanism of Action

Vacuum is believed to enhance wound healing by the following mechanisms:

1. Removal of interstitial fluid with reduction in edema thereby improving blood and nutrient flow to the wound[5].
2. Mechanical deformation of cells in the wound bed due to negative pressure[6]. This stress within the tissue results in protein and matrix molecule synthesis[7-8], enhanced angiogenesis[9], increased mitosis (cell replication) and promotion of granulation tissue.
3. Decrease in bacterial load and improved local resistance to infection with evacuation of stagnant fluid in the wound bed[10-12].
4. Decrease in the wound volume and approximation of wound edges [2, 13, 14].
5. Provision of closed moist environment which has been proved to be conducive for wound healing[15].

6. Facilitation of gas exchange through vapor permeable dressing , which is beneficial for treating wounds infected with anaerobic organisms that would thrive in an occlusive, oxygen-depleted environment[16].
7. Pulling greater numbers of keratinocytes into and across the wound; thereby, increasing the population of cells necessary for wound healing.[17]
8. Increase in the local antibiotic concentrations and facilitation of the transport of cellular and humoral components of the immune system to the infected area secondary to increased angiogenesis, resulting in significant reduction of the bacterial count and enhanced wound healing.
9. Reducing the expression of matrix metalloproteinase in chronic wounds[10, 18].

Technique of application of VAC

The technique of application of vacuum over wounds is in principle quite simple. A piece of medical grade, reticulated foam with an open-cell structure is fashioned as per the contours of the wound and then introduced into the wound .A non collapsible wound drain with lateral perforations is laid on top of it. The entire area is then covered with a transparent plastic adhesive membrane, which is firmly secured to the healthy skin extending three to five cm. beyond the edges of the wound, creating an airtight compartment over the wound. When the exposed end of the drain tube is connected to a vacuum pump, fluid is drawn from the wound through the foam into a reservoir for subsequent disposal. The foam ensures that the entire surface area of the wound is uniformly exposed to this negative pressure effect, prevents occlusion of the perforations in the drain by contact with the base or edges of the wound, and eliminates the creation of localized areas of high pressure and resultant tissue necrosis. In centres where foam is not available, gauze can be successfully utilized as a substitute. Typically, the vacuum pump can be programmed to provide various amounts of negative pressure on an intermittent or continuous basis. However suction is usually applied at between 50 and 125 mmHg. The general architecture, foam types, drapes, and regulation of the vacuum pump can be modified according to the characteristics of each wound and availability of resources.[3,4,16] Even light weight rechargeable battery operated vacuum pumps are available in affluent centres which increase the mobility, independence and comfort of the patient and can be used even on outpatient basis. There can be additional tubing for periodic instillation of antibiotic solutions which stay while the vacuum pump turns off and is than sucked out after a preset time period.The dressings are usually changed two to three times a week as compared to conventional dressings which need to be changed more frequently.

Indications of VAC therapy

Vacuum has been widely used in recent years in a variety of wounds[18] and the list of its indications is on the rise. However before embarking on VAC, it is important to define treatment aims, objectives and clinical endpoints which might include reduction in wound volume, growth of granulation tissue for later closure by other methods or even closure of wounds. In the available literature, common indications include:

- Chronic Stage III or IV pressure ulcers [20-21,]
- Neuropathic ulcers[22],
- Venous or arterial insufficiency ulcers [22],
- Chronic ulcers[22] of mixed etiology (including scleroderma, systemic lupus erythematosus, hyper coagulation disorders, rheumatoid arthritis,vasculitic conditions, post radiation[23]. In chronic ulcers with exposed bones or tendons, proper application has been found to obviate the need of higher forms of reconstruction by some prominent workers.[4]
- Dehisced wounds or wounds with exposed orthopaedic hardware or bone or vascular grafts [24]
- Partial thickness burns[25]

- Acute wounds[26]
- Post-sternotomy mediastinitis[27]
- To aid fixation or bolstering of skin grafts[28]
- Complex pilonidal disease[29-30]
- Compartment syndrome of abdomen [31]

Contraindications

VAC therapy is contraindicated for patients with:

- Necrotic tissue with eschar in the wound, if underlying disease is not being taken care of and debridement is not attempted,
- Untreated osteomyelitis within the vicinity of the wound,
- Malignancy in the wound,
- An unexplored fistula to an organ or body cavity within the vicinity of the wound.
- Cavity / sinus of unknown depth or origin
- Wound with unstable fractures, or sharp / loose fragments of bone
- Wounds with exposed blood vessels or organs

Adverse effects of VAC therapy

When used properly, very few adverse effects have been reported in literature. These include:

- **Dehydration** if fluid coming out from wound is not replaced. Special care need to be taken when VAC is used in paediatric age group or in highly exuding or large wounds.
- **Allergic reactions** to the acrylic adhesive. This usually manifests locally as rash, pruritis and swelling and only rarely can cause systemic symptoms like bronchospasm.
- **Pain** during VAC therapy or while changing the dressings. Proper technique and use of analgesics relieve this pain.
- **Spread of infection**. If VAC is used over potentially infected wounds, than constant vigil is to be maintained to detect the spread of infection locally or systemically.
- **Bleeding** if wound haemostasis is inadequate or patient has bleeding diathesis or if friable vessels are present in the vicinity of wound bed without adequate tissue cover.
- **Growth of granulation tissue into foam** - this may be avoided by using specialized non-adherent (e.g., Versa) foam or by lining the wound with a non-adherent dressing before application of sponge.

Special care also needs to be taken when dealing with patients of spinal cord injury as sensory stimulation by VAC can result in episodes of autonomic hyper-reflexia (sudden elevation in blood pressure or heart rate in response to stimulation of the sympathetic nervous system). Similarly VAC should not be used in the vicinity of vagus nerve as there is possibility of developing bradycardia. Caution also needs to be taken when using VAC over wounds of the extremities and circumferential dressings need to be avoided to avoid the possibility of vascular compromise to limb distal to the site of application of VAC.

Duration of Use

Treatment may be terminated when:

- If predetermined objectives are achieved.
- If adverse effects become unmanageable.
- Documentation shows that measurable degree of wound healing has failed to occur over the prior month.

- If four months of VAC therapy have elapsed though this period is variable as per the hospital protocols and clinical judgment of the treating physician.
- If adverse effects become unmanageable.

Cost factor of VAC therapy

Vacuum assisted closure involves use of expensive machines and disposables. However studies have shown that if utilized properly VAC can be more cost-effective than daily dressings [32]. Given that the VAC dressing is only changed two to three times weekly, nursing costs are substantially reduced. Adreana B *et al.* estimated the cost of VAC to be almost 50% less than the traditional methods of wound management.[33]

Utilization of VAC therapy in economically/technologically underdeveloped regions

It is a fact that VAC therapy involves sophisticated machines and use of expensive disposables. But due to the sheer determination of physicians and wound care specialists, this modality is increasingly reaching the poor patients which form the bulk of human population. Improvisations are being made to utilize the commonly and cheaply available equipment like suction drains and gauze to harness the benefits of vacuum for wound healing[34], see figures 1A-D. Even wall suction[35] or modified manual suction if properly utilized might help in this regard but it needs some more effort from health care providers in economically backward regions to use this modality, in spite of lack of standard equipment.

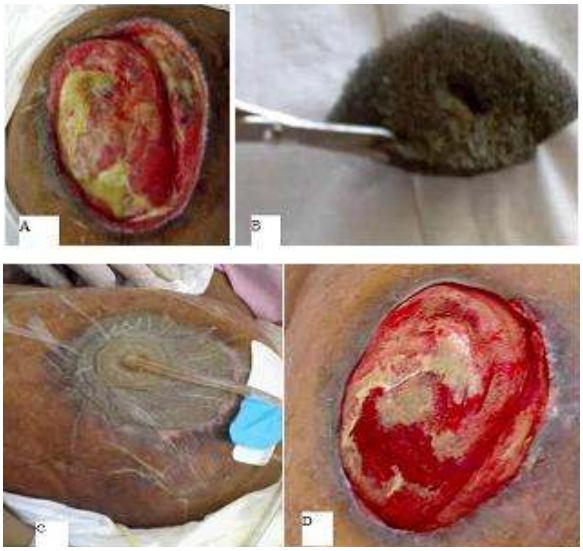

Fig 1. (A) Right trochanteric pressure ulcer. (B) Fashioning of sponge as per dimensions of the wound. (C) VAC applied over the wound in A. (D) Same wound as in A after 11 days of VAC therapy showing granulation tissue.

Conclusion

Vacuum assisted closure (VAC) is an effective and safe adjunct to conventional and established treatment modalities for the management of wounds. This therapy can be utilized even in absence of standard equipment, in economically deprived regions of the world.

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Aesthetic surgery indications at the National Orthopaedic Hospital, Enugu

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Paper was presented at the 12th Annual Conference of the Nigerian Association of Plastic Reconstructive and Aesthetic Surgeons held at Ile-Ife from 1 to 3 November, 2006

Submitted: 3 November 2009 *Accepted for publication: 26 February 2010*

Summary

Background: Aesthetic surgery is not well developed in Nigeria. It forms a small part of plastic surgery service at the National Orthopaedic Hospital Enugu. Few reports of the scope of aesthetic surgery are available from the sub region. We report our experience of aesthetic surgery in our centre, a Nigerian sub regional apex hospital specializing in plastic, orthopaedic and trauma surgery, and make pertinent recommendations.

Patients and methods: Retrospective analysis records of consecutive patients attended to between January 2000 and December 2005.

Results: Elective plastic surgical procedures performed were 3,759, of which 68 (1.81%) were for aesthetic indications. Fifteen of the clients (22.06%) were male and 53 (77.94%) female. Fifty procedures (73.53%) were performed on the face, nine on the limbs, six on the trunk, two on the skull and one on the neck.

Fifty four of these (79.41%) were scar revisions, six mammoplasties, and three were otoplasties, two cranioplasties, and one lip augmentation, one abdominoplasty and one rhinoplasty. Forty nine were carried out by consultants and nineteen by senior residents; seventeen of those procedures being scar revision. Specialized instruments such as lasers and cannulae for liposuction or liposculpture were not available.

Conclusion: Aesthetic surgery is still underdeveloped in our practice.

Key words: aesthetic surgery, mammoplasty, abdominoplasty, Enugu.

Introduction

Aesthetic surgery, an integral part of plastic surgery, may be defined as surgery in a normally functional anatomic part of the body with the aim of improving the client's acceptability of that part. Its scope is well reported in developed and westernized cultures. There are few reports on different aspects of it in our environment;[1-3] this report aims at contributing to this.

Materials and methods

This retrospective study was carried to show the proportion of aesthetic surgery in the plastic surgery service of the National Orthopaedic Hospital, Enugu. The common indications for aesthetic surgery and the demographic features were also sought from theatre records from January 2000 to December 2005. Fresh trauma cases and symptomatic lesions were excluded. Descriptive analysis for frequencies was carried out.

Result

In the period, 3,759 plastic surgery procedures were documented: 68 (1.81%) were for aesthetic indications. Fifteen of the patients (22.06%) were male and 53 (77.94%) female. Fifty procedures (73.53%) were performed on the face, nine on the limbs, six on the trunk, two on the skull, and one on the neck. Age range of patients that had aesthetic surgery was 9-47 years and the mean was 25.92 years. Mean age of males was 29.75 years, and mean age of females, 25.04 years.

Procedures:

Fifty four (79.41%) were scar revisions, six mammoplasties, and three were otoplasties, two cranioplasties, and one lip augmentation, one abdominoplasty and one rhinoplasty. Excision and direct closure was the commonest procedure for scar revision (figures 1 and 2). Z plasty was also used.

Figure 1: Facial scars, pre operative

Figure 2: Facial scars, the same patient, post operative

The procedure for abdominoplasty included plication. The inferior pedicle technique was used for mammoplasty (figure 3 and 4) and mastopexy. All scar revisions were day procedures, as well as an otoplasty. The rest were performed on admission. No face lifts, blepharoplasties, augmentation mammoplasty, or liposuction was undertaken in the period.

Figure 3: bilateral breast enlargement, pre operative

Figure 4: The same patient after bilateral breast reduction

Forty nine procedures were carried out by consultants, and 19 by senior residents; 17 of those procedures being scar revisions. All the patients were Nigerians.

Outcome

No scale of patient satisfaction was in use in the period under study. The results were loosely grouped into those with or without improvement. Improvement was recorded in all but the small tribal marks. No mortality was recorded, and there was no nipple-areolar loss following mammoplasty. Generally it was noted that the smaller the defect the less satisfactory the outcome, particularly with facial scars. It was noticed that some patients who showed an initial response of being very satisfied with a procedure would later request fine tuning of the incisions that they were initially comfortable with.

Discussion

Aesthetic surgery is performed on a functional part of the body primarily to enhance its appearance, and the decision as to what surgery is purely aesthetic is a difficult one.[4] The scope includes scar revisions and mammoplasties in western institutions.[2,5] The

percentage of aesthetic surgical procedures is much smaller than those in western centres where it is in excess of 10% of plastic procedures.[6]

A number of reasons can be adduced to the low level of cases. The level of awareness among the Nigerian populace for availability of aesthetic surgery within the country even among doctors is low.[7] Also cost is a major factor in presentation for surgery[8] and the poverty level of the populace is high as up to 66% live below the poverty line.[9] The morality of aesthetic surgery is still a major issue. This discourages potential patients. There are also religious reservations to aesthetic surgery in our environment as some adherents of both Christian and Islamic faiths are discouraged from altering "God-given" characteristics such people are born with. People therefore present themselves for conditions they are convinced if left alone result in increased disability or eventual fatality.

As in other studies in western countries there is a female preponderance for aesthetic surgery, and the face is the commonest part of the body involved.[6] This may seem to indicate there are similarities in interests in aesthetic surgery among Nigerian clients as their western counterparts; however, the pattern of requests were different. Such procedures as face lifts, blepharoplasties, augmentation mammoplasty, or liposuction common in western countries[10] were not done; they are still uncommon in our environment.[3] A lot of patients who make such requests have sun damaged skin; caucasian skin is more readily prone to sun damage than dark African skin which is found among our patients.[11]

Most of the procedures on the face were scar revisions. Among these were requests to remove tribal marks, the exact percentage could not be ascertained as unsightly facial scar was often written as diagnosis for tribal marks. This common indication in our environment is uncommon in western populations. Facial tribal marks are still common in many ethnic groups in Nigeria unlike Caucasians. Our study agrees with findings in south west Nigeria indicating many people with facial marks want them removed.[3,12] Such requests probably increase when there are inter ethnic conflicts. Our work and other studies indicate the younger age group feel more embarrassed by them;[12] a finding that may be due to the influence of westernization.

The commonest procedure for scar revision was excision and direct closure; a number had z plasty. This was because most scars presenting were wide facial scars following tribal marks. The results were acceptable to the patient when the initial scar was wide, and less so when the presenting wound was small.

Local improvisation to suit the populace should go on whilst efforts are made to obtain state-of-the-art facilities where they prove cost effective. Facilities for skin resurfacing such as lasers, chemical peels, and specialised cannulae for liposuction are currently unavailable in this centre, and most centres in the sub region. Abdominoplasty was by excision of skin and sub cutis and abdominal wall (rectus sheath) plication. The cranioplasties were for correction of contour defects of the skull following the excision of benign tumors involving the outer table. Bone cement and poly methyl methacrylate were used.

Very few procedures were undertaken by residents in training. This is probably because of the paucity of cases and the sensitivity attached to them, it also means little experience is currently being gained by trainee surgeons in this area. This is underscored by the very low volume of patients; less than 12 per year for the institution, and much less per consultant.

The outcome of surgical procedures is linked to the experience of the surgeon and centre. This paucity in volume has been previously documented. [1-3] With the current low

volume it may be advisable to pool all aesthetic requests in the institution to one unit rather than spread them out to four as is the current practice. The introduction of virtual surgery into the subregion may assist in training the next generation of plastic surgeons in this area.

No objective measures of outcome were recorded, and individual appreciation of the results varied. In local and international literature patient satisfaction is a major indicator of outcome in aesthetic surgery. [2, 3, 13, 14] However clinical photography which is also used to judge the outcome needs to become part of the clients' records in our centre and not just the surgeons' personal record.

Conclusion

Aesthetic surgery is underdeveloped in Enugu and the pattern of requests here differs in many respects from western centres. Training and instrumentation are needed in the centre.

Acknowledgement

Emmannuel Onyenzoputa provided the inspiration for the study.

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Nutritional and haematological parameters of cleft lip and/or palate patients in Lagos, Nigeria.

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Summary

Introduction: Cleft Lip and Palate (CLP) deformities are the most common congenital abnormalities of the orofacial structures. The deformity is associated with certain peculiar problems including feeding disorders and recurrent infections. These may combine to affect the nutritional status of the patients. This study was carried out to assess the prevalence of malnutrition among patients with CLP deformities in Lagos, review the prevalence of anaemia and the burden of bacterial infections.

Materials/methods: Serum albumin levels of patients with CLP invited for surgical intervention in Lagos between 2006 and 2008 were assessed to determine the nutritional status, the Packed Cell Volume for the presence of anaemia and total White Cell Count (WBC) to screen for the possibility of bacterial infection.

Results: Two hundred and twenty five patients were studied comprising of 112 males and 113 females. Mean age was 5.05 ± 7.73 years. One hundred and one (44.89%) patients had complete cleft of the lip and palate, 27.22% had cleft lip, 13.78% had cleft of the lip and hard palate, while 7.11% had cleft of the soft palate alone. Various types of rare cleft deformities occurred in 8.88% patients out of which macrostomia or lateral cleft constituted 6.67%. Forty-eight (21.3%) patients had malnutrition. The type of CLP deformities was found to have no significant effect on the serum albumin level (p = 0. 089). Sixty-eight (30.2%) patients had anaemia. There was an association between the types of CLP deformities and the PCV levels (P=0.001). Twenty-two (9.8%) patients showed haematologic evidences of on-going bacterial infections with raised total WBC count.

Conclusion: The prevalence of anaemia in patients with CLP is however higher than that of the general population. Patients with CLP require nutrition support and continuous medical monitoring.

Key-words: - Cleft lip and/palate, malnutrition, anaemia, bacterial infection.

Introduction

CLP deformities are the most common congenital abnormality of the orofacial structures[1.] The aetiology of CLP is still uncertain. However factors including genetic predisposition, environmental factors, ingestion of certain drugs, and deficiency of certain nutritional factors in the diet and infections of the pregnant mothers have been implicated.[1, 2]

The deformity is associated with some peculiar problems; prominent among these is the feeding disorder. When the palate is deficient; there is continuity of both the nasal and oral cavities. The patient will thus be unable to develop the negative intra-oral pressure necessary for sucking the breast, though swallowing remains normal. Feeding by sucking (either breastfeeding or bottle feeding) is therefore difficult and the nutritional needs of the baby may not be met. This situation is compounded by the fact that the special feeding devices specifically made for these patients are not readily available in Nigeria.

Patients with CP are known to have Eustachian tube dysfunction[3]. This may cause food particles to lodge in the tube and in the nasopharynx which may result in middle ear infections. They may also aspirate food particles into the upper airway through the palatine defects. This can also cause upper airway infections. Dental anomalies also occur in the oral cavity in CLP. The anomalies include malocclusion, enamel hypoplasia, dental caries and gingivitis[4] In addition the self cleansing ability of the oral cavity is reduced [4,5]. These anomalies may predispose to oral infections which sometimes spread to involve the respiratory tract.

The cosmetic effects of CL on the face are striking. The disparities and the haunting expressions cannot be missed[6]. The psychosocial impact of this is very important. The parents and relations are sad; babies may be neglected and are sometimes not properly taken care of. The adults face social ostracisation.[7-9]. There may be educational deficiencies. In many instances they cannot get appropriate jobs and earn very little. These adults may not earn enough income to properly feed self.

As a result of the possibility of inadequate intake of nutrients and the increased metabolic demand on the body system due to the recurrent infections, patients with CLP deformities may suffer from malnutrition. Studies by various authors including Adekeye et al [5], da Silva et al[10], and, Pandya et al[11] suggested that there might be malnutrition among cleft patients particularly those with CLP. Studies assessing the nutritional status of children and adults with CLP in Nigeria are uncommon. The current study hoped to establish the prevalence of malnutrition and anemia using the Serum Albumin and Packed Cell Volume (PCV) among a group of children and adults with CLP deformities in Lagos in south-western Nigeria.

Patients and methods

A state-wide survey, screening and sponsored treatment of patients with orofacial cleft deformities in Lagos, Nigeria were carried out between June 2006 and May 2008 at the Lagos State University Teaching Hospital (LASUTH), Ikeja-Lagos. Public enlightenment campaign using the print and electronic media preceded the exercises. All the patients with orofacial deformities that were screened and confirmed as cleft lip and or palate (CLP) deformity constituted the patients for the study.

A prospective study of all the patients was carried out. Data that were collected included: age, gender, parents educational status, occupation, and size of family. Physical inspections of the patients were carried out. The classification of Kernahan and Stark [12]as modified by the International Conference for Plastic and Reconstructive Surgeons was used for classifying the common cleft lip and palate cases and the Tessier[13] classification for the rare orofacial cleft defects.

Blood samples were collected from the patients into sequestrene and heparinised plastic containers. The samples in EDTA containers were used to estimate the PCV, WBC count and haemoglobin genotypes. The samples in the heparinised containers were used for estimating the total serum protein and albumin levels. The reference values that were used in the study were as recommended by various workers[14-16]. Patients with PCV and serum albumin values below the reference points were categorized as anaemic and

malnourished respectively. WBC count values higher than the reference values were taken as suggestive of bacterial infections in the respective patients.

Written and informed consent were obtained from all adults and parents or guardians of all the children recruited into the study. The study received the approval of Ethical Review Committee of LASUTH., and complied with all the requirements of Helsinki declaration on human studies as amended. Descriptive analysis was performed on the data collected.

Results

A total of 225 patients with CLP deformities were seen during the screening exercises. There were 112(49.78%) males and 113 (50.22) females. Mean age of patients was 5.05 ± 7.73 years. Forty-three (19%) patients were seen before the age of four months, 69.9 % presented between the ages of four months and 12 years while the rest (11.1%) were between 12 and 38 years old.

Complete cleft of the lip and palate was the commonest presentation occurring among 101 (44.89%) patients, table 1. A total of 25 (11.3%) mothers had not receive any formal education, 32.0% had primary education while 56.7% acquired either secondary or tertiary education. Forty-eight (21.4%) fathers belonged to the lower income class, 76.4% belong to the middle and 2.2% belong to the upper income classes.

Table I Distribution of the Orofacial cleft deformities seen.

Cleft lip alone.*	61 (27.11%)
Cleft lip and hard palate**	31 (13.78%)
Complete Cleft lip and palate** *	101 (44.89%)
Soft palate only	16 (7.11%)
Rare orofacial cleft deformities-:	
Tessier number 7 cleft (macrostomia, Lateral cleft)	15 (6.67%)
Others (Tessier number 14)	1 (0.44%)
Total	225(100%)
* These include Tessier numbers 6, 7 and 8 cleft	1(0.44)
** These include Tessier number 2 cleft)	2(0.89)
***These include Tessier number 4	1 (0.44)

Haemoglobin genotype AA was the commonest (59.11%), table 2. Thirty-three (14.67%) patients were not old enough for the determination of the haemoglobin genotype. Sixty-eight (30.2%) patients had PCV values that were less than 30%, tables 3 and 4. (30% is the lower limit of normal for PCV[14, 15]) .There was a strong association between the types of CLP deformities and PCV levels (P=0.001).

Table 2. Pattern of haemoglobin genotype in patients with cleft lip and palate.

Haemoglobin Genotype	Frequency	Percent
AA	133	59.1
AS	48	21.3
SS	6	2.7
SC	5	2.2
Not old enough For determination	33	14.7
Total	225	100.0

Table 3: Haematological and Biochemical parameters in patients with CLP.

Parameter	Mean	Range
Age (years)	5.5 ± 7.7.	0.1-38
PCV (%)	31.7± 5.7	9.0-53.0
WBC count ($\times 10^9$/L)	7.7±3.6	2.6-27.1
Total Serum Protein (g/dl)	6.8±1.1	4.5-13.1
Serum Albumin (mg/dl)	4.1±0.6	2.8-5.5

Table 4 PCV distribution in patients with CLP deformities.

Deformities	No of Patients with PCV >30%	No of Patients with PCV <30%
CL	41(67.2%)	20 (32.8%)
CLP	68 (67.3%)	33 (32.7%)
CP	24 (77.4%)	7 (22.6%)
Rare	8 (50.0%)	8 (50.0%)
Soft	11(68.8%)	5 (31.2%)

Twenty-two (9.8%) patients had WBC counts that were raised above the normal for the age groups, table 5 (the ranges of normal values are : 4-11 $\times 10^9$ for adults and up to15 $\times 10^9$ for children[14-16]) The extent and types of cleft deformities had significant effects on the WBC counts. (p=0.000)

Table 5 WBC distribution in patients with CLP deformities.

Deformities	No of Patients with non pathologic# WBC count	No of Patients with pathologic # WBC count
CL	57(93.4%)	4(6.6%)
CLP	89(88.1%)	12(11.9%)
CP	27(87.1%)	4(12.1%)
Rare	14(87.5%)	2(12.5%)
Soft	16(100%)	

Key:
#Pathologic WBC counts-
Children
Up to 7years >15 $\times 10^9$/L
8-12years >13.5 $\times 10^9$/L
Adults >11$\times 10^9$/L

The distributions of the total serum protein and albumin levels are as shown in Tables 6 and 7. Forty-eight (21.3%) patients had serum albumin level less than 3.6mg/dl. (3.6mg/dl is the lower limit of normal [14]). The type of CLP deformities was found to have no significant effect on the serum albumin level (p = 0. 089).

Table 6 Distribution of serum protein in patients with CLP.

Deformities	No of Patients with normal # Serum Protein	No of Patients with low# Serum Protein (g/dl)
CL	50 (82.0%)	11(18%)
CLP	90 (89.1%)	11(10.9%)
CP	30 (96.8%)	1(3.2%)
Rare	15 (93.8%)	1(6.3%)
Soft	15 (93.8%)	1(6.2%)

Table 7 Distribution of serum Albumin in patients with CLP.

Deformities	No of Patients with normal # Serum Albumin (mg/dl)	No of Patients with low# Serum Albumin (mg/dl)
CL	45 (73.8%)	16(26.2%)
CLP	85 (84.2%)	16(15.8%)
CP	24 (77.4%)	7(22.6%)
Rare	9 (56.3%)	7(43.8%)
Soft	14 (87.5%)	2(12.5%)

Key: #
Serum albumin level
Normal >3.6mg/dl
Low <3.6mg/dl

Discussion

This study has shown the prevalence of malnutrition using a biochemical parameter and anaemia among Nigerian patients with CLP deformities. There are various methods by which the nutritional status can be assessed. These are either anthropometric or biochemical. The anthropometric measurements reflect the states of physiologically important tissues; the fat and the somatic protein[17.] Biochemical indices can also be used to assess the nutritional status of individuals. Parameters that can be used include the total serum protein, albumin and transferin measurements. These are highly sensitive indices that can reveal the immediate nutritional status of individuals. The serum protein level however can be affected by the globulin fraction. The globulin level in the blood can be influenced by non- nutritious factors including infections.

Serum albumin was used in this study to assess the nutritional status of the patients. It has been found to be a good measure of the nutritional status of individuals[17.] It is easy to measure, result is reproducible, accurate and the best single indicator of surgical risk. It is free from dependence on the skill of the operator. It can be assessed in most standard Biochemical laboratories. It measures the visceral protein. The proportion of patients with serum albumin level less than 3.6mg/dl in the study is 21.3%. This is the prevalence of malnutrition among the patients using the biochemical method. Using the prevalence results from nutritional studies conducted in Nigeria by previous workers, the prevalence of malnutrition among patients with CLP deformities in Lagos, Nigeria is minimal. Sebanjo et al [18] found a prevalence of 23.1%, and WHO[19] quoted 27.2% for Nigeria. National prevalence of wasting reported by the National Demographic and Health Survey in the year 2000 for south- western Nigeria was 25.1%[20]. Anthropometric parameters were used for these studies. .

The socio-economic status of the family had been shown to have direct effects on the health status of the family in Nigeria [21,22] It is thus possible that the parents and the adult patients have heard about the need for and the methods of nutritional management in patients with CLP deformity even before the study. Previous studies on the assessment of the nutritional status of patients by Fadeyibi et al [17] and Osibogun et al [23] showed that the results of the prevalence rate of malnutrition are higher using the anthropometric parameters when compared with biochemical methods. It is thus possible that the prevalence of malnutrition in patients with CLP in the study may be a reflection of the prevalence of malnutrition among the people in their immediate community.

Malnutrition predisposes patients to diseases[17,23]. Nutritional deficiencies affect the immune system negatively. Abnormalities are caused in the thymus resulting in impaired differentiation of the T-lymphocytes. All the cell-mediated immunologic processes that are dependent on the mature T-cells will be affected. Complement activation is also

reduced due to the reduced synthesis and increased consumption of complement components.[17,23,24.] The defenses are lowered. This condition may affect the effective management of these patients that often require multiple reconstructive surgical procedures.

The prevalence of anaemia in the study is 30.2%. The prevalence of anaemia in the study is clinically higher than the 10% anemia reported by the UNICEF [25] and 27.5% by Jeremiah[26] for south-western Nigeria. The higher prevalence of anaemia in the study may be a direct reflection of the nutritional status of the patients and the concurrent effects of the multiple infective processes that the patients are prone to.[3-5]. The haematological parameters were more significantly affected in patients with bilateral cleft lips and clefts of the hard and soft palates. This may be due to the feeding difficulties encountered by these set of patients. Patients with complete cleft of the palates are also more prone to infections as previously discussed.

White Blood Cell counts (WBC) are important as part of investigative parameters for Pyrexia of Unknown Origin (PUO) and the assessment of infectious conditions in patients. The various reasons that make patients with CLP susceptible to infections have been discussed. Infections cause nutrient loss, reduced appetite and malnutrition. Malnutrition depresses the immune system defenses further making the individuals prone to infection and the cycle continues.[23.]

Conclusion

This study has demonstrated that the prevalence of malnutrition among the patients with CLP deformities in Lagos is not significantly different from that of the general population. The prevalence of anaemia is however higher in the study population than was reported by UNICEF for South-Western Nigeria.

Recommendations

Children with orofacial clefts should be given extra attention in terms of control and treatment of any infections they may acquire. They will also need to be monitored for malnutrition and anaemia prior to the time they can have corrective surgery.

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Cleft lip repair with subcuticular closure at National Orthopaedic Hospital, Enugu: Is there any advantage?

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Presented in part at:
1. First Scientific Conference of Nigerian Association for Cleft Lip and Palate In Ile-Ife, Oyo State, Nigeria (October 31-November 1, 2006)
2. Poster Presentation Session at the 5th Congress of the International Cleft Lip and Palate Foundation Dallas, Texas, (September 22-26 2008)

Submitted: 3 February 2010 *Accepted for publication: 26 February 2010*

Summary

Background: Skin closure in unilateral cheiloplasty with non absorbable sutures is commonly practiced, resulting in longer hospitalisation and another anaesthetic session for suture removal in children; increasing costs and risks. Subcuticular suturing obviates crosshatching and may also result in a finer scar, an advantage in patients with oily pigmented skins. Subcuticular closure became routine in the hospital in 2004. This five year study was undertaken to verify if subcuticular closure in unilateral cleft lip surgery reduced the burden of care.

Patients and methods: Consecutive patients with unilateral cleft lip repaired at the National Orthopaedic Hospital, Enugu from January 2004 to December 2008 were studied retrospectively. There were 33 patients with subcuticular sutures and 84 with skin sutures. The follow up was a month to four years.

Result: Patients with skin suture had 124 surgical sessions and a mean of 7.11 days after surgery before discharge; and those with subcuticular sutures spent a mean of 2.43 days after surgery before discharge. Complications were similar in both groups. Subcuticular closure was associated with reduced hospitalisation time and anaesthetic sessions; reduced risks, costs, and burden of care.

Conclusion: The technique of subcuticular suturing may be considered as a viable alternative to non absorbable skin sutures.

Key words: cleft lip, subcuticular closure

Introduction

Closure of the lip with non absorbable sutures is a more common practise globally. This necessitates a second anaesthetic session for removal in children: increasing costs and risks. Cleft deformity is commonest among the low socio-economic group; and costs influence their compliance with surgical procedures.[1] Protocols designed to reduce the burden of care are needed especially for such patients who are significantly limited in resources. Crosshatching from skin sutures persist occasionally to adulthood and are displeasing. Scarring and crosshatching are worse in oily pigmented skin.[2] Subcuticular (or intradermal) closure obviates the need for external skin sutures, and circumvents the

possibility of suture marks on the skin, and so may actually lead to a finer scar.[2, 3] This study was undertaken to verify if subcuticular closure in cleft lip surgery reduces the burden of care thereby conferring an advantage.

Patients and Methods

This is a five year retrospective study. All unilateral cleft lip patients operated on in the period are included. Indices assessed included number of theatre sessions; days spent in hospital after surgery, and recorded complications.

Technique of subcuticular closure in Cleft lip repair

In closing the upper lip 8-16 buried interrupted sutures were placed in the dermis with vicryl sutures. All sutures were atraumatic and the needle size was 16mm or less. After the subcuticular closure steristrips were used to hold the skin. The strips were subsequently removed within five days if they had not already fallen off. All children with subcuticular sutures had a single anaesthetic session during their admission. The follow up was up to four years.

Patients that had only notch correction as well as those that had combined cheiloplasty and palatoplasty were excluded from the study.

Result

There were 117 unilateral lip cheiloplasties (including revision surgeries) performed in the hospital; 60 were male and 57 female, 86 (73.50%) were isolated and 31 (26.50%) combined lip and palate. The age at surgery ranged from six weeks to 60 years mean of 8.125 years. Thirty three patients had subcuticular repair and 84 had interrupted nylon skin sutures.

Patients with subcuticular sutures had a single theatre session (table 1); all adult repairs were day procedures, and the children were discharged within one day to 17 days (mean of 3.65 days) post operatively. Children with skin sutures spent a mean of 7.78 days, while adults spent 1.38 days after surgery before discharge. All adults and the children who did not have a second anaesthetic session for suture removal had them removed in the ward or outpatient department.

Table 1: A comparison of the subcuticular and skin suture groups.

	Subcuticular group	*Skin suture group*
Total number of patients	33	84
Adults (16 yrs and above)	11	14
Children (below 16 yrs)	22	70
Combined lip and palate	6	25
Isolated lip	27	59
Mean age at surgery in months	106.88	95.02
Day procedures	18	10
Total theatre/anaesthesia sessions	33	124
Days between repair and discharge(mean)	2.43	7.11
Days between repair/ discharge: children(mean)	3.65	7.78
Days between repair/ discharge: adults	0	1.38

In the subcuticular closure group, figures 1b and 2, there were two incidences of partial wound dehiscence that involved the nasal floor and right philtral column in one patient, and one involving the nasal floor in the other patient. They closed completely without intervention. A linear scar was present at the philtral ridge (figure 1b). Hypertrophic scarring was noted in another patient. In the skin closure group complete wound

breakdown and infection requiring wound toilet was noted in one patient. No keloid was been noted. Complications not attributable to technique among patients with subcuticular suture included redundant lip mucosa noted in three patients at the repair site.

Figure 1a: A pre operative view of a patient with cleft lip

Figure 1b: Post operative picture of the same patient after subcuticular closure.

Figure 2: Post operative view of a boy four years after subcuticular closure.

Discussion

Previous studies have ascertained if the use of subcuticular stitches conferred an advantage over non absorbable sutures.[4, 5] Such works focused on possible aesthetic advantage of absorbable sutures in children but found none.[4] In lip repair the severity of the cleft affects the aesthetic outcomes also. Some had reported excellent aesthetic results with either group but suggest absorbable sutures are preferred since they reduce the risk of stitch abscess,[5] and there is an increasing trend towards the use of inverted absorbable sutures to hold the dermis with or without cutaneous sutures.[3]

Recent work indicates no difference in suture complications between the two groups.[6] The question of aesthetic superiority with the use of subcuticular sutures was not the focus of this study and no scale was in use in the hospital during the study period to measure aesthetic outcomes. This may be an oversight or due to lack of information on the part of the surgeons. This work indicates that it is associated with reduced number of procedures, days of hospitalisation and anaesthetic sessions. The reasons for staying up to a week were to obviate (or manage) post operative complications and to remove sutures. Younger children do not cooperate well enough to have facial sutures removed without anaesthesia and since the next anaesthetic session is a week later in this hospital, most inpatients remained in the ward until then although facial sutures can be safely removed after three to five days.

In communities with well developed home care medical services such delays are not expected. A number of patients however had suture removal in the outpatient department, or in the ward following ketamine sedation (oral or parenteral). This reduced the number of times such patients were brought into the theatre and days spent in the ward post operatively, but not necessarily the number of anaesthetic sessions or procedures. Suture removal is a procedure and administration of sub anaesthetic doses of ketamine still requires supervised care. Avoiding a second anaesthetic session definitely reduces risk to the patient; no matter how minor. More than one anaesthetic session has been noted in previous work in the same environment.[1, 4]

Previous work indicates that the minimum post operatively admission days of cleft lip patients was seven days, and the minimum theatre sessions two; the second for suture removal.[1] By reducing hospital stay in this study (from over seven to less than four days post operatively), and no second anaesthetic session the use of subcuticular stitches is associated with reduced risks of anaesthesia and nosocomial infections in this study in our environment. The cost of anaesthesia for removal of sutures in this hospital is half that for cheiloplasty. Moreover the loss in man hours for the parents and carers of such children is significantly reduced, further reducing the loss economically to them, and the nation. The number of days spent in the ward in our series is high compared to other reports, but such still indicate that the use of subcuticular stitches was an advantage.[6] Cost and aesthetic considerations significantly impact decisions by cleft patients in terms of completion of procedures.[1, 7] Subcuticular stitches are not the only means of avoiding a second anaesthetic session in children. The use of 6-0 catgut for skin sutures in children also obviates that.[3] However the range of sutures available in many hospitals in Nigeria are frequently limited.

The age at surgery varies widely. It may be a reflection of late awareness of solutions. The techniques used in the repairs were based on previously described techniques. [8] The use of prophylactic antibiotics in lip repair is also widespread .[9] It has been previously noted that infection rates appear higher in sub-Saharan hospitals.[10] The complications attributable to the procedure were in two patients and are similar to those found elsewhere.[6]

The technique reduced the burden of care among our patients. Protocols which are equivalent in outcome but reduce the burden of care on the patients are preferred. Every adult expressed satisfaction with the end result. There were some patients however who despite subcuticular stitching remained in the hospital for two weeks after surgery; such patients had post operative complications. This may have affected our results.

The study did not however address the time it takes to close with subcuticular stitches as against skin sutures. Such details were not available in case notes from the beginning of the study period. The authors believe subcuticular closure takes slightly longer especially in children for the beginner, but does not unduly prolong anaesthesia time. With practice time differential probably will become insignificant. A higher number of day procedures were recorded among those having subcuticular closure. It is possible that it is because of the use of subcuticular stitches, a finding seen among other developing countries. [6] The use of subcuticular stitches is well suited for day procedures, [6, 11] and day care cleft procedures even among the paediatric age group are gaining popularity in developing nations. [6, 11 , 12]

Exact matching of skin points at the vermillion edge in Cupid's bow recreation is more difficult if skin sutures are not used.[3] This was also our experience. Skin tapes were routinely used in addition for approximation; however their early removal tended to result in a somewhat wider scar (figure 2). Prolonged application of the skin tapes would counter that. The use of subcuticular sutures for all age groups is an option for satisfactory repair and discharging the patients in poor resource settings, as well as within the last days of outreach surgeries. This work indicates a less costly technique is available in Nigeria.

Conclusion

Subcuticular sutures are associated with reduced hospitalisation time, reduced anaesthetic sessions, and therefore reduced cost, risks, and burden of care to the cleft patient. It may be considered from this point of view as a viable alternative to non absorbable skin sutures in Nigeria.

Acknowledgement
The authors acknowledge the inspiration from Joshua ben David, and the assistance of Drs. Ilokanula and Jagusa , Ms Onwuetu and the Medical Records Department in data acquisition.

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Report of hereditary gingival fibromatosis in two Nigerian siblings

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Submitted: 29 August, 2008 *Accepted for publication: 9 November 2009*

Summary

Background: Hereditary Gingival Fibromatosis (HGF) is a rare condition with a prevalence of 1:750,000, and can present as an isolated disorder or more rarely as a syndrome component. It is characterised by a slow and progressive enlargement of both maxillary and mandibular 28rganiza with varying severity between individuals within the same family. This paper reports the occurrence of HGF in two young patients from the same parents.

Materials: Detailed clinical evaluation revealed a positive history of generalised gingival swelling in the two patients, in the eldest child of the family, and an uncle. There was no history of intake of drugs that could predispose to the development of gingival hyperplasia. Intra oral examination showed generalised gingival hyperplasia involving the lingual and buccal regions of both maxillary and mandibular arches.

Conclusion: Screening other siblings of patients who present with delayed eruption and gingival enlargement for HCF with the view of instituting early and effective plaque control in order to reduce severity of the enlargement is recommended.

Key words: hereditary, gingival fibromatosis, gingivectomy, gingivoplasty.

Introduction

Hereditary Gingival Fibromatosis (HGF), also known as Elephantiasis Gingiva ,Hereditary Gingival Hyperplasia, Idiopathic Fibromatosis, and Hypertrophied Gingiva, is a rare condition with a prevalence of 1:750,000[1], and can present as an isolated disorder or more rarely as a syndrome component [2-5]. The most common type of syndrome is that comprising gingival fibromatosis, hypertrichosis and mental retardation[6].

HGF is characterised by slow and progressive enlargement of both maxillary and mandibular gingival [2]. There is no sexual predilection [3]. Most cases of HGF appear to be inherited in an autosomal-dominant manner[7,8], although autosomal-recessive disorder has been reported[9-11]. The onset of gingival enlargement in most cases is at early infancy preceding eruption of teeth, although it may not develop until later in childhood.

Typically, the hyperplastic 28rganiza in HGF presents with a normal colour has a firm consistency, and abundance of stippling of the attached gingival[9]. Buccal and lingual tissues may be involved in both the maxilla and mandible [2, 3]. The degrees of enlargement

vary from mild to severe, and may not be the same between individuals within the same family [8, 9]. The gingival enlargement may delay eruption of teeth in children. In addition to aesthetic concerns, the compromised oral cavity may also cause difficulty in eating, speech, oral hygiene and oral competence. Social consequences can also be dramatic, forcing patient to live isolated reclusive lives[12]. This paper reports the occurrence of HGF in two young patients from the same parents.

Case Report:

A nine year-old boy and his 13-year-old sister presented at the out-patient clinic of the Dental department, Lagos State University Teaching Hospital (LASUTH) Ikeja- Lagos, Nigeria, with complaints of generalised gingival swelling and delayed eruption of permanent teeth. The complaints were more severe in the 9-year-old boy. The gingival swellings almost covered the teeth. The eldest child of the family was said to have had similar complaints but this was described as less severe. They also claimed that a milder form was noticed in an uncle of the patients. The medical history was essentially normal. There was no preceding history of epilepsy, any other types of seizure disorder, nor intake of medications which could predispose to development of gingival hyperplasia. There was neither signs of hypertrichosis nor mental retardation.

General physical examinations did not reveal any abnormality in all parts of the body except the oral cavity which revealed generalised gingival hyperplasia involving palatal and buccal regions of maxillary and mandibular arches. The enlargement was more severe in the nine year-old boy, with only the occlusal surfaces of the deciduous canine and molars visible in the mouth. There was no eruption of any permanent tooth, figure 1. In the 13-year-old girl, the enlarged gingival tissues covered at least half of the clinical crown of almost all the teeth present, figure 2. The gingivae in both patients were normal in colour and consistency. A clinical diagnosis of HGF was made.

1

2

Figure 1: The 9-year-old boy with no visible permanent teeth and only occlusal surfaces of the deciduous canine and molars visible

Figure 2: The 13- year-old girl with the enlarged gingival tissues

Initial management of the patients included scaling of all teeth on the 13-year old, with instructions to improve oral hygiene at home. The parents of the patients rejected surgery.

Discussion

Generalised gingival hyperplasia can be caused by a variety of etiologic factors. These factors include tissue inflammation, leukaemic infiltration and medications. Drugs that have been implicated include phenytoin, cyclosporine and nifedipine[3,4]. About 50% of patients taking phenytoin for prolonged period will manifest gingival hyperplasia[14]. HGF can occur as part of a syndrome. It has been reported as a feature of Murray-Puretic' Drescher's syndrome (multiple hyaline fibroma), Rutheford's syndrome(corneal dystrophy), Laband's syndrome(ear, nose, bone and nail defects with hepatomegaly), Jone's syndrome(progressive deafness) and Cross syndrome(microphthalmia, mental retardation, athetosis and hypopigmentation)[15]. HGF has also been reported in association with growth hormone deficiency due to lack of growth hormone releasing factor (GHRF)[16]. Whyne and colleagues in 1995 reported a new syndrome of HGF occurring with hearing deficiencies, hypertelorism and supernumerary teeth [17].

In these two cases, a diagnosis of HGF was made because no medication previously associated with the condition was taken by the patients or their mother either during the pregnancy or while breastfeeding. The family history also revealed that the 18-year old first child of the family had similar, though milder gingival condition. The patients exhibited no other signs of any known syndrome. HGF can be inherited as an autosomal dominant or recessive condition[5, 6,8,9,15]. Bozzo and colleagues reported autosomal dominance in a four-generation pedigree with 50 of 150 at-risk family members developing gingival fibromatosis [8].

Gingival tissue enlargement usually begins with eruption of the permanent dentition but can develop with eruption of deciduous dentition; it is rarely present at birth [5,15]. In this series, the gingival enlargement started just before the onset of loss of deciduous dentition and gradually increased in severity. Few cases have arisen in adulthood[5]. In a study involving 17 members of a family with gingival fibromatosis, Fletcher reported that the most extensive enlargement seemed to occur during loss of deciduous teeth or during the early stages of eruption of permanent dentition[1.] He noted that the enlargement seems to progress rapidly during "active" eruption stages.

The suggested treatment of HGF varies according to the stage of teeth eruption and the severity of the enlargement. Scaling and root planning of teeth and sufficient home care may maintain good oral health when enlargement is minima[5,15]. This was the management plan for the second patient that was reported in this series. However, surgical intervention is required when enlarged tissue impairs function and appearance and act as barrier to the eruption of teeth [5, 15]. Bozzo et al [18] and Bittencourt [19] suggested a conservative approach with their cases based on the patient's condition. Some authors recommend excision of excess tissues combined with removal of all teeth in severe cases. They suggested that the condition may not recur if the teeth are extracted[3]. The most widely used surgical approach is gingivectomy/gingivoplasty [3,18-20]. If there are large areas of gingival enlargement associated with attachment loss and osseous defects, preferred treatment may be periodontal flap procedure [5,21]. Gingivectomy/gingivoplasty procedure was planned for both patients due to the absence of attachment loss and osseous defects in association with the gingival enlargement. Though HGF occurring in siblings of same parent have been reported by some authors[1,9,16,] this appears to be the first report in Nigerians.

Recommendation

HGF being a rare condition which has not been reported among Nigerians, it is important that Oral Health Care Providers should screen other siblings of patients who present with delayed eruption and gingival enlargement for the condition with the view of instituting early and effective plaque control in order to reduce severity of the enlargement.[7]

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The burden of open fractures of the tibia in a developing economy

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Submitted: 4 November 2009 *Accepted for publication: 12 March 2010*

Summary

Background and purpose of study: Open fractures are difficult to treat particularly because of the risk of infective complications. The rudimentary emergency rescue services in a developing country like ours with attendant delays in presentation of patients amongst other factors would suggest a dismal outcome for open tibial fractures in Nigeria.

Patients and methods: Ninety two patients with 98 open tibial fractures who presented to the University College Hospital (UCH), Ibadan over a 12-month period were reviewed. The aetiology and severity of these fractures were explored as well as the treatment outcomes.

Result: The mean age was 33.3 years (peak 21-40 years) with men being 2.4 times at risk. Eighty three percent were from road traffic injuries; pedestrian crashes led other traffic injuries with 32% of cases. A quarter of the patients presented after 8 hours of injury. Three quarters of the fractures occurred in the shaft. Gustilo type IIIb injuries was the commonest (36.7%). The methods of treatment included plaster cast (71.5%), external fixation (15.7%), plating and primary amputation (5.7% each), and intramedullary nailing (1.4%). Average time to union was 26.2 ± 12.7 weeks. Forty six late complications occurred in 32 fractures (there were 6 cases of chronic osteomyelitis).

Conclusion: The incidence and severity of open fractures in our environment calls for urgent steps geared towards reducing the incidence of road crashes. The provision of standard, prompt and affordable emergency as well as definitive health care facilities for the victims should be a priority.

Keywords: Tibia, open fracture, emergency services.

Introduction

With development of communication and transportation as well as the increase in the volume of vehicles on Nigerian roads the incidence of traffic injuries is on the increase. Among the injuries from traffic crashes, open fracture of the legs is common[1]. Although open fractures can be well treated, the management of severe open tibial fracture remains a challenge particularly in the developing world where medical and social facilities are inadequate. The peculiarity of this injury is the great risk of infective complications among others and particularly that of loss of the limb. Previous local studies were either generalized reviews of lower limb fractures or retrospective in nature[2,3]. This study explores the pattern of open tibial fractures in a developing economy against the background of the peculiarities of road transportation, financial limitations and the rudimentary emergency rescue services with the attendant delays in presentation of patients for treatment.

Patients and Methods

The setting is University College Hospital, an 805-bed tertiary hospital which together with others serves the southwestern states in the country, with a catchment population of about 20 million people. Nigeria is a typical developing nation with underdeveloped social amenities. Major roads are tarred but their maintenance is poor and these are plied mainly by equally poorly serviced second-hand vehicles and motorcycles. The latter have gained popularity in recent years as a means of public transport but helmets are rarely used. All these, in an environment where traffic rules are not well enforced make our roads hazardous[4]. Ethical approval for this study was obtained from the University of Ibadan/University College Hospital Institution Review Committee.

Consecutive patients with open fractures of the tibia seen at the accident and emergency (A&E) department and the fracture clinic of the surgical out-patient department of the hospital over a twelve-month period between January 2003 and December 2003 were recruited into this prospective study. The biodata, mechanism of injury, associated injuries as well as other systemic disorders were documented. Physical examination was carried out on each patient to assess the extent of injuries.

Radiological assessment was done, after which the fracture morphology and classification was recorded. The severity of the open fractures was determined according to the method proposed by Gustilo *et al*[5]. The Injury Severity Scores (ISS)[6] and the Mangled Extremity Severity Scores (MESS)[7] were computed for each patient.

All the patients reviewed were initially assessed, resuscitated and investigated in the A&E. Tetanus prophylaxis was administered and the fractures were copiously irrigated and debrided in the A&E on arrival. The limb was splinted and parenteral antibiotics administered based on the prevailing bacterial spectrum in open wounds and the sensitivity pattern in the hospital[8] after obtaining wound swabs for microbial culture and sensitivity; definitive treatment was commenced thereafter. The standard method of fracture stabilization was chosen based on severity of the soft tissue injury and the stability of the fracture. They were thereafter admitted to the ward or discharged to the clinic and followed up till fracture union.

Four patients with clinically obvious tibial fractures who requested for discharge before radiological examination could be done were excluded from this study. The outcome of treatment was analysed with respect to the speed of fracture union and the presence of complications. Fracture union was based on clinical as well as radiological assessments.
Descriptive analysis was performed on the data. The Pearson's chi-square non-parametric test was used to determine the statistical significance between qualitative variables.

Results

Ninety eight open fractures of the tibia were seen in ninety two patients during the twelve-month period (an average of eight fractures a month). There were 69 males and 29 females (M: F ratio 2.4:1) with a mean age 33.3 ± 14.8 years (range = 3 – 70years). The peak age was 21-40 years. The age distribution and causes of the injuries are as shown in table 1.

Mode of transport to hospital

Figure 1 shows who transferred the patients to the hospital. Only 65% of patients presented within eight hours of the injury.

Injury description

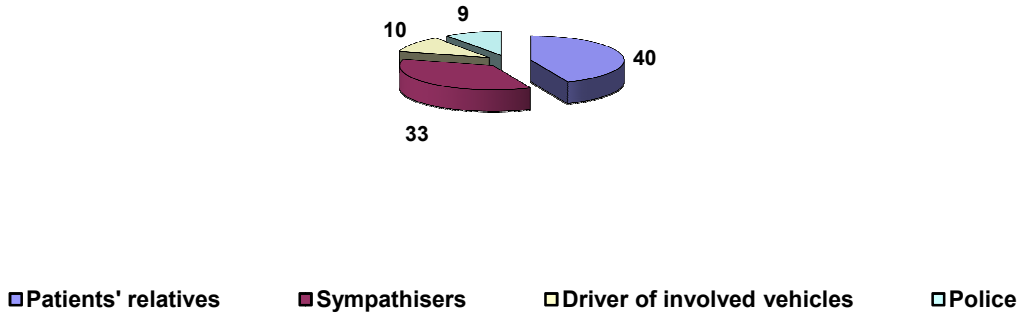
The left tibia was involved in 58 cases (59.2%); a left: right ratio of 1.5:1. The shaft was the commonest site of open tibial fractures, 75 patients or 76.5% of cases. This was followed by the tibial plateau in nine (9.2%), medial malleolus in five (5.1%), pilon in four (4.1%) and multiple sites in three (3.1%).

Table 1:
Age distribution and causes of open tibial fractures seen between January 2003 – December 2003

Age (in years)	*Fall*	*PRTI*	*Bike*	*VRTI*	*Gunshot*	*Others*	Total (%)
0 – 5	-	1	1	-	-	-	2 (2.2)
6 – 10	-	1	1	-	-	-	2 (2.2)
11 – 20	-	8	2	-	1	-	11 (12.0)
21 – 30	-	4	9	-	1	1	24 (26.1)
31 – 40	1	6	6	9	4	1	25 (27.1)
41 – 50	-	2	4	7	1	2	12 (13.0)
51 – 60	2	4	1	3	1	1	12 (13.0)
61 – 70	-	1	-	3	-	-	2 (2.2)
Unknown	-	2	-	1	-	-	2 (2.2)
Total (%)	3 (3.3)	29 (31.5)	24(26.1)	23 (25.0)	8 (8.7)	5 (5.4)	**92 (100)**

PRTI : Pedestrian Road Traffic Injuries ; Bike : Motorcycle injuries ; VRTI : Vehicular Road Traffic Injuries

Figure 1: Pie chart showing who conveyed the patients with open tibial fractures to the hospital between January– December 2003



Type IIIb (Gustilo) was the commonest type of open fracture observed (table 2). The details of fracture configuration was recorded in 72 cases; the fracture line was oblique in 32 (32.7%), transverse in 27 (27.6%) and spiral in 13 cases (13.3%). There was little or no comminution in 38 patients. Table 2 compares the severity of fracture comminution with the cause and the severity of open fracture. There was significant bone loss in eight open tibial fractures. Bone segments lost ranged from 2-22cm. There was ipsilateral fibular fracture in 78 of the cases (79.6%).

Injury severity & complications

Mean MESS was 3.3 ± 1.4. Associated injuries occurred in 41 patients (44.6%). Details are shown on figure 2. Mean ISS was 19.7 ± 7.6. Twenty eight patients (30.4%) had injuries of minor severity (ISS 3-15), injuries were moderate (ISS 16-24) in 42 (45.7%), while 22 (23.9%) were severe (ISS > 25). Severe Gustilo type of fracture tended to be significantly associated with severe injuries ($p < 0.05$). There was also an association between road traffic crashes and injury severity although this was not statistically significant ($p > 0.05$).

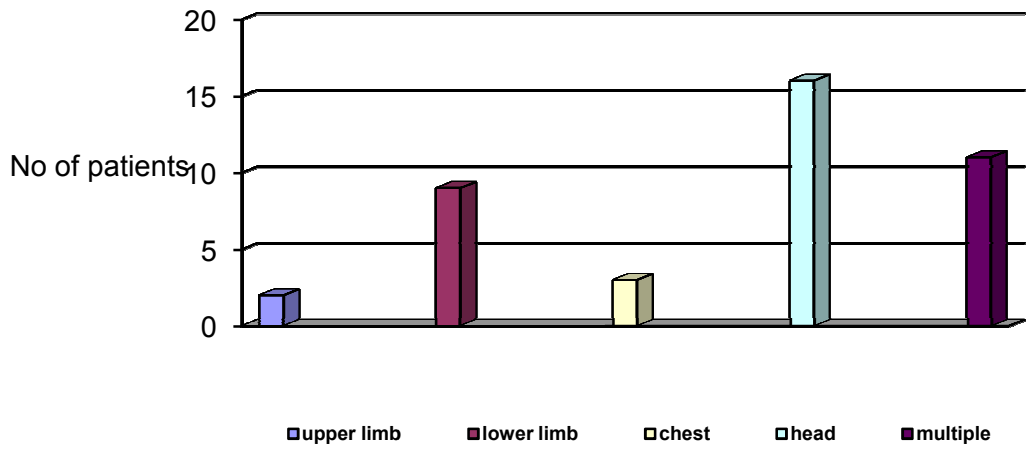
Acute complications occurred in 20 patients (21.7%). Nine of these had septic complications (45%), circulatory shock occurred in 5 (25%), two had compartment syndrome (10%), while four (20%) had other complications including acute respiratory distress, fat embolism and acute urinary retention. Acute septic complications were found in 6.3%, 3.7%, 15.6% and 28.6% of types II, IIIa, IIIb and IIIc open fractures respectively.

Table 2: Severity of open tibial fracture comminution with respect to the cause of injury and type of open fracture as seen between January 2003 – December 2003

Characteristics	Severity of Comminution				Total
	None	Comminuted	Segmental	Segment.-commin.	
Cause of Injury					
Fall	0	2	0	0	2
PRTA	11	14	4	2	31
Bike	7	10	2	5	24
VRTA	17	5	3	0	25
Gunshot	1	5	0	2	8
Others	2	3	0	0	5
Total (%)	38 (40.0)	39 (41.0)	9 (9.5)	9 (9.5)	**95 (100.0)**
Open fracture type					
I	7	1	0	0	8
II	9	7	1	0	17
IIIa	9	14	3	1	27
IIIb	11	14	4	6	35
IIIc	2	3	1	2	8
Total	38	39	9	9	**95**

PRTI : Pedestrian Road Traffic Injuries ; Bike : Motorcycle injuries ; VRTI : Vehicular Road Traffic Injuries

Figure 2: Chart showing incidence of associated injuries in open tibial fractures seen between January 2003 – December 2003



Four patients were admitted into the Intensive Care Unit (ICU) for injury severity and acute complications. A total of 26 patients (28.3%) with 28 fractures were discharged before definitive treatment for reasons ranging from lack of funds for treatment, lack of theatre or bed space, to patients' decision to seek treatment elsewhere. The methods of treatment for the remaining 70 fractures in 66 patients were: POP cast with window (45 cases), external fixation (11 cases), skeletal traction followed by POP cast (five cases), plate osteosynthesis (four cases), primary below knee amputation (four cases) and tibial nailing for one patient. Delayed skin grafting was employed to cover the granulating wounds for three fractures treated with POP casts. Six fractures managed by external fixation had a flap transfer to cover the soft tissue defect at the same surgery (fix-and-flap). All type IIIc open fractures as well as those with MESS ≥ 6 had primary below knee amputation.

The patients were followed up for a period ranging from one week to sixty six months (mean 17.1 ± 9.6 months). Union was documented for 63 fractures; time to union ranged from 8 to 56

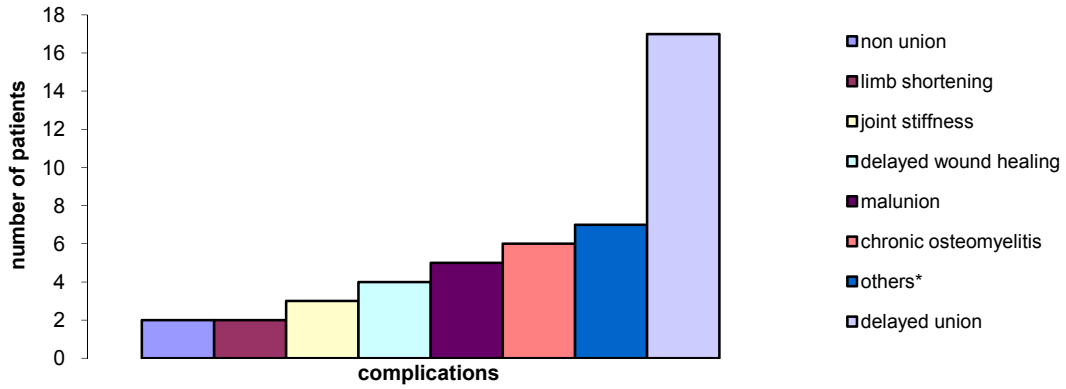
weeks (mean = 26.2 ± 12.7 weeks). Table 3 shows the mean time to union for open tibial fractures.

Table 3: Time to union for open tibial fractures seen between January 2003 – December 2003

Part of Tibia	Mean (wks)	Range (wks)
Ankle	17.0	8 – 21
Plateau	20.0	13 – 34
Pilon	22.5	13 – 34
Shaft	28.8	17 – 56

Thirty three fractures united without complications. Figure 3 shows the 42 late complications which occurred in 32 fractures. Five of the six cases of chronic osteomyelitis complicated type IIIb open fractures (14.3% of type IIIb) while one occurred in a type II fracture (5.6%). Acute septic complications and/or chronic osteomyelitis occurred in 16.7%, 3.7%, 31.4% and 37.5% of types II, IIIa, IIIb and IIIc open fractures respectively (21.4% of all type III open fractures). None of the cases complicated by chronic osteomyelitis had an acute septic complication. The risk of septic complications increased with the severity of open tibial fracture (p= 0.03). The method of treatment had no significant influence on the incidence of complications.

Figure 3: Late Complications of Open Tibial Fractures seen between January 2003 – December 2003



**Others: myonecrosis following compartment syndrome (1), skin donor site sepsis (1), lateral collateral ligament laxity (1), flap necrosis (1), pin track infection (1), decubitus ulcer (1), and fracture redisplacement (1).*

Discussion

This study shows the usual male predisposition to tibial fractures in keeping with older reports[3,9]. The mean age of patients in this series is also similar to that obtained from other studies[2,3,10] although subjects were a decade older in the report by Court-Brown *et al*[9]. Open tibial fractures in our children are largely due to pedestrian road crashes in contrast to Cullen *et al*'s report[11]. This is probably a reflection of the poor road safety consciousness/commitment of our drivers and emphasizes the need for the protection of this vulnerable group on our roads. The high incidence of gunshot injury is illustrative of the increasing wave of armed banditry in our society; even compared to local studies, this is unprecedented[2,3].

Onabowale *et al*[3] also had observed a similar predisposition of the left tibia to open fractures although other local studies which considered all tibial fractures (closed and open) showed a reversal of the ratio[12,13]. Road traffic crashes remain undeniably the leading cause of open tibial fractures, of these, motorcycle and vehicular crashes seem to be catching up with pedestrian road injuries although the latter remains the leading cause (accounting for a third of cases)[3]. The increasing popularity of the motorcycle as a means of transportation and the increase in the number of motor vehicles on our roads following the financial empowerment of civil servants in

Nigeria within the last decade may account for this trend. Another possible explanation is the reduced incidence of pedestrian road crashes compared to other road traffic injuries. Epidemiological studies on road traffic crashes in our environment will shed more light on this.

The rudimentary state of our emergency rescue service was highlighted as more than 90% of the patients were conveyed to the hospital by relatives and sympathizers with little or no training in basic trauma care. Thus, only 65% presented within eight hours of injury, a situation which probably contributed to the zero limb salvage rates for type IIIc and MESS > 5 in this series. It is pertinent to note that a similar study[3] conducted about a decade ago showed a longer interval before presentation suggesting a slow but increasing awareness of the need for prompt transfer of the injured and improved utilization of medical services. Much more however, still needs to be done by the authorities concerned to ensure adequate emergency rescue services.

The shaft remains the predominant site of open fractures as it is also for closed fractures[9]. With the greater proportion of open tibial fractures being comminuted/segmental or severe open fractures (Gustilo types IIIa and IIIb), it becomes evident that most of our cases were due to high energy injuries. Complex soft tissue reconstruction, though not readily available in our environment is indicated while the need for ICU care is also increased. The weight of evidence suggests increased incidence of open tibial fractures in our environment over the years[12]. Our figures for severity using the Gustilo classification is appalling when compared to those from developed countries[5,7]. Accident prevention and vehicle designs that limit severity of automobile accidents is a significant factor accounting for the relatively less severe open fractures obtained in these countries.

As is often the case in tibial fractures, ipsilateral fibular fracture was the commonest injury associated with open tibial fractures in this series[11]. That injuries in our study are more severe is evidenced by the average ISS which is seven units higher than that observed from a similar study conducted in Edinburgh[9]. Severe injuries often require ICU admission which is not readily available in our hospitals in the developing world; hence, only four of our 22 severely injured patients had access to intensive care. The financial burden of treatment in the ICU was another major factor accounting for this. It is believed that any effort aimed at curbing road traffic crashes will not only reduce the incidence of tibial fractures but will also reduce the severity of injuries associated with them.

The high rate of discharge from hospital before definitive care is not unusual in this part of the world; this is in fact an improvement on an earlier report of 47.6% by Oguachuba[13]. It may be an important source of bias in this study. The improving level of education and awareness of health matters in our environment is believed to reflect on the increasing preference for orthodox treatment as observed in this series.

Our amputation rate is akin to the experience of Court-Brown *et al* with type IIIc injuries[9]. The appalling MESS cut-off in our series can be attributed to the delay before presentation such that limbs are often frankly gangrenous aside from the fact that the cost of emergency limb salvage procedures is usually beyond the financial capacity of our patients whose treatments are largely self-financed. It has also been shown that limb salvage in the face of financial limitation is known to be potentially hazardous[14]. The newly introduced National Health Insurance Scheme (NHIS) is expected to assist such patients as well as provide ready funding for equipping and developing the health system in our country. It is believed that when fully operational, this insurance scheme will create opportunities for universal access to emergency health care, better transportation of injured patients, and standard treatment methods. The average time to union of the open pilon and tibial shaft fractures is longer than that reported by Ikem *et al*[2] in spite of the higher incidence of infective and other complications in their series. The differences may be related to the severity of the associated soft tissue injury in our study.

Open fractures are particularly liable to complications which make the 50% rate in this series not unusual for late complications; Ikem *et al*[2] reported 74.5%. Although a certain number of fractures will remain contaminated and become infected whatever treatment is offered, Templeman *et al*[15] have advised that the surgeon should diligently adhere to the imperatives of open fracture care since infection after these severe injuries is probably multifactorial. The early and late infective complications in this study were better than what was found by Ikem *et al*[2] and Ostermann *et al*[16]. Ostermann *et al*[16] have also shown improvement in the incidence of infective complications with the use of local antibiotic therapy. The 10% incidence of chronic osteomyelitis was similar to Onabowale *et al*'s finding[3]. Generally speaking, our study shows a slight improvement in the complication rates compared to previous reports from Nigeria; the reasons for this are not clear but may be related to the observed reduction in the delay before presentation, the antimicrobial policy of our unit as well as the combined orthopaedic and plastic surgical treatment which has been shown to improve outcome[17].

Conclusion

Open fractures in our environment are becoming more common and more severe in terms of the soft tissue component. This places a huge demand on the purses of our patients who are usually self-financed as well as on the health system of our developing economy. Efforts should be aimed at mitigating road crashes through the enforcement of road safety laws, provision of motorable roads as well as the provision of standard, prompt and affordable health care for the victims. The relevant authorities should provide emergency rescue services in order to eliminate the adverse effect of delay on treatment outcome. The newly introduced National Health Insurance Scheme holds much promise in the area of hospital facility development and accessibility to treatment.

Conflict of interest statement

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article. There are no relationships with people or 38rganizations that could inappropriately influence this study.

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The burden of open fractures of the tibia in a developing economy: invited comment

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Thank you for asking me to comment on this article. The current study is a very good one that was set to outline the burden of open tibia fractures in Nigeria-a developing country with all the attendant problems of bad road network, poor and un- organised methods of transporting accident victims to hospitals as well as delay in attending to patients due to the fact that the patients and families have to provide all financial needs for the care in most cases. The peculiarity of this study is also the fact that it is a prospective study which makes it distinct from previous works that have been done in Nigeria on open tibia fractures. This however put the burden of ensuring that the best is given to the patients within the limit of the facilities and the financial provision on the authors. The aetiology, sex prevalence, the mean age of the patients, types of injuries and complications are similar to the previously published works in the country[1,2].

Soft tissue cover remains one of the major needs of patients with open tibia fractures. Indeed, complication rate as well as the length of hospital stay is likely to be reduced when soft tissue cover is taken into consideration from the time of admission of the patients. A number of patients may indeed benefit from flap cover at the time of insertion of external fixators/debridement (as noted in the patients with “flap and fix”). One would have expected a prospective work like this to add to the protocol the assessment of the reconstructive options for the legs. This would most certainly allow early closure of the wounds by local or regional flaps rather than leaving the wounds to granulate.

Galumbeck[3] had noted that early cooperative efforts by Orthopaedic Surgeons and Plastic surgeons improved the outcome for their patients and had permitted successful salvage of otherwise severely injured limbs. It has also been observed, as noted in the current study, that providing adequate soft tissue cover for open fracture remains a problem to both patients and attending surgeons especially in absence of microvascular techniques. Notwithstanding, early cooperation between Orthopaedic and Plastic surgeons in the management of open tibia fractures in this environment has been suggested[1]. Fasciocutaneuos flaps, proximally or distally based or still, islanded are useful in all regions of the leg and are superior to muscle flaps for bone coverage[4]. The use of muscle flaps and adipofascial flaps have been reported from this

environment with reduction in infection[5]. Vascularised soft tissue is relied upon for improved blood supply, to provide immunoglobulins, deliver antibiotics and to manage dead space. Free flaps have been described as the ideal for the distal third of the leg as muscle flaps are often not available for use in this region. Early consideration for these options will reduce complications often seen in patients with open tibia fractures in our environment. Only cooperation between Reconstructive and Orthopaedic surgeons to ensure early and joint assessment of the surgical needs (both soft tissue and orthopaedic) could make this possible and reduce complications following open tibia fractures in Nigeria.

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Partial Auricular Defects; Classification & Reconstruction Guideline

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Submitted: 6 February 2010 *Accepted for publication: 10 March 2010*

Summary

Background: The protruding position of the auricle makes it susceptible to trauma and results in a wide variety of auricular defects .Therefore many techniques had been developed for reconstruction .To select a proper technique may represent a challenge to the occasional otoplastic surgeon. This article proposes a classification and suggests guideline for reconstruction of acquired auricular defects.

Methods: From May 2004 to December 2006, 49 male victims with acquired auricle defects underwent reconstructive surgery. The proposed classification and the therapeutic guidelines were implemented. Among the surgical options, simple direct closure for wedge defects were accomplished, helical advancement technique for moderate auricular defects confined to the helix, and cartilage patch grafts for major auricle loss. Clinical assessment of the outcome in form of good, satisfactory and poor was recorded in the patient's last visit.

Results: Early complication was seen in one patient and late complications in two. In those that presented late; one presented with size problem and the other with size and shape problems. The results were good in 36 patients, satisfactory in 11, poor in two.

Conclusion: Among several therapeutic options; selecting the proper procedure for specific auricular defect can be better guided by the proposed classification.

Keywords: Acquired ear deformity, microtia, auricular reconstruction, traumatic auricular defects.

Introduction:

The unique protruding position of the external ears, makes them more exposed to trauma. Among the common causes of acquired ear defects are car accidents, sports or work related injuries. Human or animal bites are less commonly encountered. Few cases are related to burn injuries[1]. An occasional cause is surgical resection of auricular tumors and the least exceptional cause is mutilation of the ear under punitive circumstances.

Modern auricular reconstruction began in the 20th century. Gilles was the first to describe the use of cartilage graft in auricular reconstruction[1,2] in 1920. In 1930, Pierce described the basic method of creating an auricular framework from cartilage graft[3,4]. Tanzer had made popular the

use of autogenous rib cartilage for reconstruction[5,6]. Brent and Nagata have refined these techniques over the last 2 decades[7,8,9] Firmin was able to add fine touches to auricular reconstruction[10,11] . Recently a Silastic framework and temporalis fascial flaps have been incorporated in the reconstruction[12,13]. The unavailability of adequate skin cover especially in major traumatic auricle defects made the use of periauricular tissue expander attractive by ensuring sufficient colour matched skin cover[14,15]. Fortunately most of the minor to moderate auricle defects can be repaired successfully by helical advancement technique which was initiated four decades ago by Antia and Buch[16]. This article proposes a classification and suggests surgical guideline for reconstruction of auricular defects which may be of help to the occasional otoplastic surgeons.

Method

Between May 2004 and Dec. 2006, 52 patients with partial auricular defects were referred for reconstruction to the Plastic Unit in Al-kindy Teaching Hospital, Baghdad, Iraq. All were males with age range of 30 to 37 years and mean age being 33.5. Their injuries dated back to 1994 when political punishment was practiced to the opponents of the regime. Initial physical and psychological assessments were carried out. Three patients who required psychiatric treatment were excluded while 49 patients were operated upon. Preoperative photographs were taken. According to the type of auricular defects they were classified into two main subgroups, as shown in table 1.

Table I: Proposed Classification of auricular defects in 61 patients

Partial auricle defects	Subtypes of defects	Number	%
Auricular wedge	1	3	6.122%
Auricular rim	2	7	14.285%
Auricular upper 1/3	3	25	51.020%
Auricular upper 2/3	4	9	18.367%
Hemi auricular	5	5	10.204%
Total number		49	100%

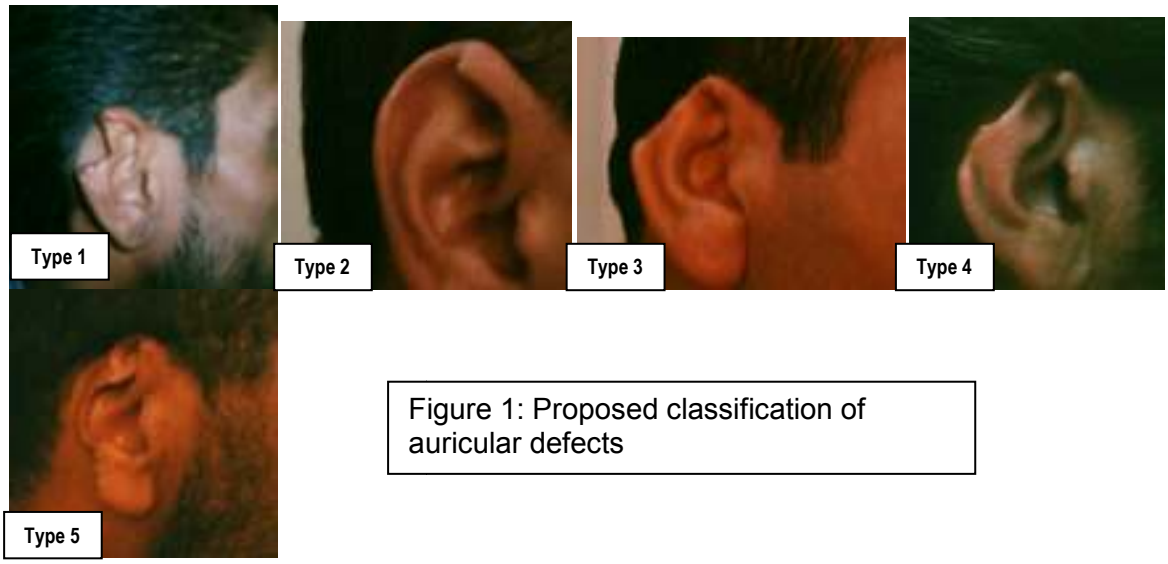

Figure 1: Proposed classification of auricular defects

According to the proposed classification, the suggested surgical guidelines for reconstruction were implemented (figure 2). Patients who presented with type 1 auricle defect when the size of the defect was < 1.5 cm; the reconstructive procedures were accomplished by direct closure.

For patients who presented with auricular defects types 2 and 3 with a defect size of < 3 cm, the reconstructive procedures were helical advancement technique (figure 3).

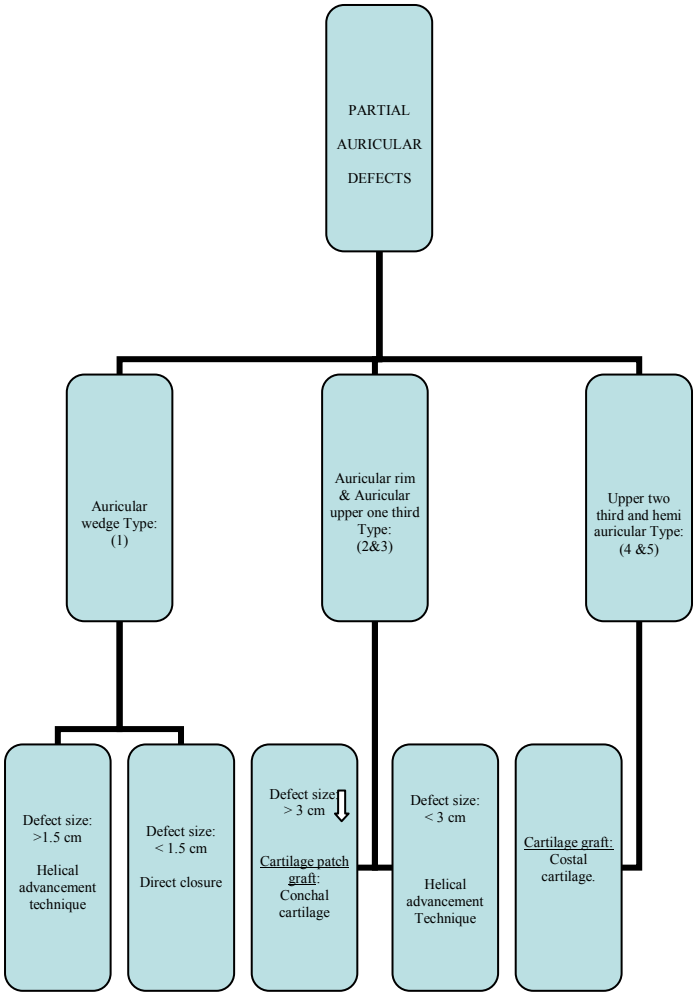

Figure 2: Surgical guidelines

Figure 3: Helical advancement technique

Patients who presented with a 3 cm type 3 defects had a cartilage patch graft harvested from the ipsilateral or contralateral concha. Those who presented with types 4 and 5 defects had ipsilateral rib cartilage harvested. Skin cover was provided following cartilage patch graft by either Dieffenbach flap advancement technique, or Converse tunnel procedure. Further stage of elevation of reconstructed framework required partial or full thickness skin graft to cover the secondary defect**.** The patients were followed up for six month period after the reconstruction had been completed. Clinical outcome was assessed at the patient's last visit into good, satisfactory and poor. Shape, size and symmetry, was felt to be principal factors while details of the neo-auricle were assessed as secondary factors.

Results

There were three patients with type 1 defects and the selected procedure was direct closure. Seven patients had type 2 and nine had type 3 defects. The seven patients had helical advancement. For patients with defects size > 3 cm, type 3 (16 patients), type 4 (nine) and type 5 (five), the reconstruction was cartilage patch graft. The cartilage patch graft was harvested from ipsilateral concha in seven patients while from contra lateral concha in nine patients and from costal cartilage in 14 patients.

The skin coverage was provided by advancement flaps in 16 patients, and by Converse tunnel flaps in 14 patients. Complication occurred in three patients (6.122%). One patient presented with mild chondritis, early in the course of reconstruction (2.04%) and two patients presented with late complications (4.08 %). Small reconstructed neo-auricle in one patient and small cupped ear in the second patient as shown in table 2. The overall assessment was good in 36 patients, satisfactory in 11, poor in two.

Table 2: Complications (6.122%).

Type of complications	Number of patients	%
Chondritis	1	2.04%
Small neoauricle	1	2.04%
Small cupped neoauricle	1	2.04%
Total	3	6.12%

Discussion

In general, patients with acquired auricular defects must be critically examined to detect the exact anatomic defects present. Among different surgical techniques available for a reconstruction, optimal as well as less optimal techniques are available for a specific situation, and the choice of technique is dictated primarily by the surgeon's experience and skill. Selecting the proper procedure may be a challenge to the surgeon. Therefore adherence to therapeutic guidelines may be beneficial to occasional otoplastic surgeon.

The reconstruction in this case series was accomplished by direct closure for defect type 1 or helical advancement technique for selected defects type 2 and 3 of < 3cm .The closure methods required one stage procedure. For patients with defect type 3 of >3 cm, type 4 and 5, the reconstruction required cartilage patch graft and the closure methods required multistage procedure with almost good outcome. The drawback of one stage repair is the ultimate reduction in the auricle size comparing to the base line, and development of occasional rim notch as evident in two patients. While the advantages are many; being simple, one stage, preserve the configuration of the helix and better patient's acceptance. The multistage reconstruction is more complicated; requiring longer time, less patient's acceptance while the advantage is preservation of normal auricle size avoiding the annoying asymmetry.

The harvested conchal cartilage graft from either side was better than the fabricated rib cartilage in term of optimum matching with the remnant cartilage. The provision of the skin coverage was not found to be a problem in partial auricle defect. On the contrary, in cases of microtia or total auricle loss, the skin lack presents a problem[5,16]. The rate of early complications in this series was 2.04 % in form of chondritis in one patient. The infection was minimal and well localized and was managed successfully by multiple mini-curettage and local irrigation of antibiotic as well as systemic antibiotic. Harris et al did not experience any infections and believe this was due to use of prophylactic antibiotic at the time of surgery[18], while Kobus et al report an infection rate of 2.5% in a series of 272 consecutive auricular reconstructions[19]. We feel that infection may occur despite meticulous sterile technique and per operative antibiotic therapy. The two patients who developed small or /and cupped neo-auricle belonged to helical advancement

group. Further studies are required to re adjust the size of auricle defects eligible to helical advancement technique to prevent such complication.

Many assessment methods are available to measure the reconstructive outcome of an auricle [9, 18, 19]. Obviously, the size, shape and degree of symmetry of the neo- auricle can be assessed easily but the details of the shape and configuration are more difficult to measure and remain subjective[5]. We feel that using the above mentioned criteria will make it possible to assess the reconstructive outcome of the neo auricle into good, satisfactory and poor.

Conclusion

In partial auricle defects, selecting a proper procedure for specific defect can be better guided by the proposed classification especially for the occasional otoplastic surgeon.

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Orbital surgery – a two year audit of practice in a craniofacial centre

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Submitted: 1 February 2010 *Accepted for publication: 11 March 2010*

Summary

Background: The surgical techniques and materials used in orbital reconstructive surgery vary widely. The choice of method and material for a given case often depend on the preferences and experience of the surgeon. Periodic audit of practice is desirable to evaluate the successes and failure in a center and to compare experiences with other centers.

Objective: This study was undertaken to review the indications, surgical approaches, methods and materials used for orbital reconstruction/recontouring and the incidence and type of complications of the surgery at our centre.

Materials and method: The clinic database was explored to retrieve the records of patients who had orbital surgery between May 1, 2005 and April 30, 2007. The required information were retrieved and tabulated to review the current indications, techniques and outcome of orbital surgery at the center.

Result: There were 11 patients involved in the audit including 9 males and 2 females within the age range of 10-60 years, mean age of 25.6 ± SD 13.1 years. Trauma was the most frequent indication for surgery, the coronal and transconjunctiva approach to the orbits were favoured and cranial bone graft and Goretex were the preferred materials for reconstruction. Ocular and non ocular postoperative complications were observed. Many of the patients involved had delayed primary or secondary intervention in which case the quality of treatment outcome was affected and further operations were required to correct residual symptoms and complications

Conclusion: Although, there are many complex techniques and esoteric materials being employed worldwide, the approach in this center is a simplistic one with preference for autogeneous calvarial bone graft and use of Gore-Tex where alloplastic material was considered adequate. These principles have been adopted with considerable success.

Keywords: Orbital reconstruction, ocular complications, autogeneous grafts, alloplastic materials

Introduction

This study was undertaken to review the indications, surgical approaches, methods and materials used for orbital reconstruction/recontouring and the incidence and type of complications of the surgery at the craniofacial centre in Southfield, Michigan, USA. The indications for orbital surgery vary widely; it includes facial trauma, orbital tumours, congenital and developmental deformities. By far, traumatic injury appears to be the commonest reason for orbital surgery in the world literature[1]. The absolute indication for surgical intervention in

such cases include persistent diplopia within 30^{o} of primary gaze lasting more than 10-14 days post injury, enophthalmos of greater than 2 mm, and restriction of ocular movement especially in upward gaze resulting from inferior muscles entrapment[2,3]. In these situations, exploration and sometimes reconstruction of the orbital floor and/or medial wall is often required.

In orbital tumour, bone involvement sometimes necessitates removal of part of the orbital skeleton and bone reconstruction. In some other cases, especially in benign conditions such as fibrous dysplasia and orbital neurofibromatosis, recontouring is what is required to restore orbital shape and volume, to create a space for eye prosthesis, or to relieve compressive symptoms of the optic nerves and globe[4,5,6]. On the other hand, Complex cranial and orbital ostectomies is usually required to modify the shape and size of the craniofacial complex in patients with congenital and developmental craniofacial deformities[7].
Irrespective of the indication, the surgical approaches to the orbital skeleton are standard, depending on the objective and extent of treatment contemplated. The coronal, lateral eye brow, and supratarsal fold incisions provide access to the upper, medial and lateral aspects of the orbit while transconjuctival, subcilliary, subtarsal and infraorbital and transantral approaches facilitate easy access to the floor[8]. Sometimes, these approaches are combined to achieve adequate access.

Increasingly, many materials and techniques are being employed in orbital wall reconstruction. The unending search for the most functionally and cosmetically compatible material with minimal or no demerits is stimulated by the relative deficiencies of most of the current materials and techniques in use. The spectrum ranges from autogenous bone[9,10,11] (calvaria, iliac, maxillary, and ribs) to nonresorbable allelografts[12,13] such as metallic implants (titanium mesh, titanium plate), non-metals such as Gore-Tex, silastic, silicone, methyl methacrylate and resorbable implants[14,15] such as micro and macroporous polyethylene (Medpor), polyglactin (Vicryl), polyglycolic and polylactide materials. These have been employed in various combinations and techniques in experimental animal studies and clinical practice[15,16]. The incidence of complications following orbital reconstructive surgery can be considerable, they range from infection and extrusion of materials to diplopia, enophthalmos and blindness. This audit was conducted to appraise the practice and experiences at our centre in the last 2 years.

Method

The clinic database of the Craniofacial Institute, Southfield, Michigan, USA was explored to retrieve the records of patients who had orbital surgery between May 1, 2005 and April 30, 2007. Sixteen cases were found and the case files were retrieved and perused to document the specific diagnosis and type of orbital surgery undertaken. Five cases which involved complex craniofacial reconstruction were excluded. These include procedures of fronto-orbital advancements, facial bipartition and correction of orbital hypertelorism etc. The remaining 11 cases involved patients who had primary or secondary orbital surgery to correct posttraumatic deformities and post orbital tumour resection.

For these, the age, sex, site, indication for surgery, surgical approach, material/technique employed, intra-operative and postoperative complications and period of follow-up were recorded and analyzed. The surgery was classified as ‘primary’ or ‘secondary’ respectively if this was the first or second attempt to correct the orbital symptoms or deformities. If the primary surgery was undertaken after 2-3 weeks of orbital injury/defect it was tagged ‘delayed primary’ while operation to correct complication or residual symptoms following primary or secondary surgery was regarded as ‘second operation’.

Result

In summary (Table 1), there were 11 patients that included nine males and two females within the age range of 10-60 years. The right orbit was involved in three cases and the left orbit in

eight cases, no bilateral involvement was noted. There were three tumour-related and eight trauma- related indications for surgical interventions. In four cases, the operations were performed as primary surgery; four were delayed primary while the remaining three cases were secondary surgery among which the first surgery had been done in another facility in one patient.

Most frequently (eight cases), the coronal approach was used while trans-conjuctival incision was favoured in three cases. No case of combined approach was documented in any of the treated cases within the audited period. The floor was the most frequently reconstructed part of the orbit (seven cases) followed by medial wall (three cases) and lateral walls (two cases). There were also two cases of orbital recontouring/decompression which involved the entire orbit. The roof and orbital rim were only sparsely repaired. The materials most favoured were cranial (or calvarial) bone graft and Gore-Tex which were each used in five cases either singly or in combination. There was only one experience of intra-operative complication while the postoperative complications include ocular complications in four patients and non-ocular complications in three patients.

Intra-operative complication was observed in one patient who had massive bleeding secondary to the hemorrhagic nature of the resected tumour. The postoperative complications included: ocular complications: diplopia, restriction of ocular movement, persistence of enophthalmos, orbital dystopia, granuloma formation; and non-ocular complications: Coronal wound dehiscence, hematoma formation and infection.

Discussion

Contiguous involvements by neoplasia, fibro-osseous lesion or trauma often result in significant symptoms and deformities of the orbito-facial complex usually requiring surgical correction. The intervention which is basically to correct the volume and the delicate architecture of the orbit should be undertaken with a lot of caution and experience because of the potential complications which may follow.

A quick survey of published reports on orbital reconstructive surgery revealed a preponderance of male patients undergoing the procedure.[10, 17-22] This is explicable on the basis of greater male involvement in trauma which happens to be the commonest indication for orbital reconstruction[1]. In this audit, we also observed male preponderance and more frequent involvement of the left orbit. The latter may likely be an incidental finding; however, there is a possibility of an association between handedness of the individual patients and the side of the face commonly involved in orbital injuries.

Generally, the repair of the floor and then medial wall is most commonly undertaken compared to the roof and lateral wall[9]. Orbital rim repairs could also be relatively common because of its frequent involvement in orbito-zygomatic complex fracture. In this audit, the frequency was in the order of floor, medial wall, lateral wall, rim and roof. With the development of the field of craniofacial surgery there has been significant improvement in the approaches and techniques to orbital surgery. Wide exposure of the orbit is now possible especially in orbital tumour surgery where large area may require resection, recontouring and reconstruction. In trauma related cases however, exposure may be limited to the aspect of the orbit requiring repairs except in situations where more than one aspect is involved. In spite of these developments, there is still a big controversy as to the best methods for orbital reconstruction[23]. The choice of approach and techniques still depends largely on the surgeon's preference.

In the present audit, the coronal approach was most favoured partly because it was preferred by the senior surgeon (ITJ) as a means of achieving adequate exposure with hidden scars and partly because many of the cases involved repairs of more than one aspect of the orbit[24]. In

isolated orbital floor repairs however, the transconjuctival approach was preferred essentially because of its good healing quality, direct approach, good vision, cosmetic outcome and low propensity for complications[8]. Although, the surgeon occasionally combines these approaches to facilitate comprehensive repairs of multiple orbital wall deformities, in this audit, this was not done because the coronal approach was found adequate - even in some cases where a floor defect had to be repaired.

Other major advancements in orbital surgery have been the use of rigid stabilization with mini- and microplates, metal mesh alone or in combination with bone grafts, and the developments of a rich armamentarium of other alloplastic materials for reconstruction of orbital defects[7,12,23,25]. Autogenous bone graft was traditionally preferred because of its high tissue compatibility and osteogenic and osteoconductive potentials[11] while proponents of alloplastic implants have emphasized the ease of use, shortened operation time and ease of resizing and reshaping of the materials as the relative advantages[15]. In this audit, there is an obvious bias in favour of autogenous bone grafts and Gore-Tex as replacement materials for orbital wall and floor defects. Methyl methacrylate was employed in one case where significant recontouring of the medial wall was required. The bias for bone graft is built upon the experience and versatility of the senior author; his preference is the calvarial graft which was taken as a split-thickness graft in these patients. Although the use of autogeneous bone grafts has been generally criticized for creating additional donor site morbidity, extended operation time, unpredictable resorption rate, and contouring difficulty[1], the calvarial graft has gained popularity because of its low infection rate and less resorption compared to other bone graft sources[11,22]. In a previous publication involving the senior author (ITJ)[24] our technique for overcoming the contouring difficulty with calvarial bone graft has been described. The coronal approach facilitates easy harvest of the graft without additional donor site exposure and morbidity which reduces operation time and required postoperative care.

A variety of alloplastic material such as silicone, Teflon, tantalum mesh, polyethylene, methyl methacrylate and bioceramics have been used for orbital reconstruction[13,17,23,25]. The primary concern with the use of alloplastic material has been the risk of infection with extrusion or posterior migration[13,25,26]. The metal mesh, macroporous polyethylene and porous ceramic implants have been noted to reduce tendency for extrusion or posterior migration because of fibrovascular ingrowth into the pore spaces,[22,27] this could however become a disadvantage in situations where an indication for removal arises. However, some surgeons have found the use of metal mesh[23] or porous bioceramics[26] alone very adequate when alloplastic material is employed. In this audit, metal mesh was not used; rather an extruded metal mesh was removed from the orbital roof and replaced with bone graft in an orbit that was previously reconstructed in another hospital. When alloplastic material was thought to be adequate, Gore-Tex was preferred in our center because of its easy handling characteristics - resizing and reshaping, and because it was easy to remove when required. It was used where adequate bony ledge was available at the margin of the defect to provide a stable seat. Only in one case was silicone used in this audit and it was because of non-availability of Gore-Tex at the time.

Generally, orbital surgery is intriguing, for the best results, the intervention must be timely. Various authors have advocated repair within the first two to three weeks of injury or immediately post tumour resection[2,3,5,9]. The challenge that often confronts this centre is that many of our patients present later than the suggested interval for early intervention. Some individuals who had had initial operations before presenting to us and those in whom the primary intervention had been delayed often require more operations to correct some persistent or worsened symptoms. This is particularly so because of the tissue adhesion and fibrosis that had taken place in the area which detracts from the quality of outcome.

The incidence of intra-operative complication in the orbital surgery was very low; one patient had severe intra-operative bleeding which was due to the hemorrhagic nature of the resected neurofibromatous tissues. Postoperative complications on the other hand were many, occurring in eight patients. The propensity for complications was more in cases where primary intervention had been delayed or secondary intervention was being done. Although some of the complications noted were mere persistence of preoperative symptoms, the symptoms were worsened in a few patients. Other complications encountered were surgical wound dehiscence which was managed conservatively and infectious complications such as osteomyelitis and maxillary sinusitis which required additional operations for correction. The complications were successfully treated in most cases but there are a few which are yet to be corrected as at the time of this audit.

Conclusion

Quality of treatment outcome as well as a higher reoperation rate occurred because many of the patients had delayed primary or secondary intervention. Although, there are many complex techniques and esoteric materials being employed worldwide, the approach in this centre as evidenced by this audit is a simplistic one with preference for autogeneous calvarial bone graft, reduction of surgical site morbidity by the use of a single exposure for surgical repair and harvesting of graft, wide exposure of the orbit for multiple area or large defect repairs, limited exposure via transconjuctival incision for isolated small orbital floor defect, use of Gore-Tex where alloplastic material was considered adequate and the use of methyl methacrylate when extensive contouring is required. These principles have been adopted with considerable success.

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History of Plastic Surgery at National Orthopaedic Hospital, Enugu.

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Introduction:

Major warfare has always impacted positively on the development of surgery, more especially Plastic Surgery. Antibacterial therapy, volume replacement and blood transfusion were very important in the survival of victims of the 1st World War. Survival quality became the focus of the 1st pioneers of modern plastic surgery like Sir Harold Gilles, who is regarded as the father of modern plastic surgery. In like manner, survival quality became the focus of the East Central State Government of Nigeria after the civil war when the zone was inundated with civil war victims with numerous and varying degrees of deformities. Thus, the Orthopaedic Hospital Enugu was established by the then East Central State Administrator Ajie Ukpabi Asika in line with the Federal Military Government's post-war policy of Reconciliation, Reconstruction and Rehabilitation.

The former Governor's Lodge was converted into a hospital with focus on the aforementioned government policy. The history of Plastic Surgery in these parts is interwoven with that of the hospital as plastic surgery developed hand-in-hand with its cousin Orthopaedic Surgery. The hospital was initially named Haile Selassie Institute for Orthopaedic, Plastic and Ophthalmic Surgery and formally commissioned by the Emperor Haile Selassie of Ethiopia, in 1975. It was later taken over by the Federal Military Government under the then Military ruler General Olusegun Obasanjo in 1979 and re-christened National Orthopaedic Hospital, Enugu. The Ophthalmic division relocated to Kaduna while Orthopaedic and Plastic Surgery thrived hand in hand, as partners in progress.

Personnel: The 1st Plastic Surgeon to practice his trade here was Dr. J.C. Nwozo who was appointed a Consultant. Prior to his appointment, Dr. J.E. Igwe (Late) had taken up appointment as the Medical Director and Consultant Orthopaedic Surgeon. Dr. J.C. Nwozo played the role of Sir Harold Gilles. He set the ball rolling and provided the beacon of light and hope for our unfortunate brothers and sisters afflicted by war and other related injuries. Trained in the best of British traditions, Dr. J. C. Nwozo brought the expertise of Sir Harold Gilles and compatriots down to the shores of Eastern Nigeria. He was joined shortly afterwards by Dr. L. M. Iregbulem. These two pioneers elevated surgery to a level previously unimagined in these parts.

Head and Neck surgery became demystified; repair of cleft lip and palate became routine. Techniques available for these procedures were brought down to the operating tables in Enugu and the people became enthusiastic. Patient load increased and scope was further extended.
The progress, this duo achieved then was made possible by the presence of Plastic Surgical trained Nurses whose pioneers were Mrs Egbujie, Mrs Uchenyi and Mrs Obuekwe. They were also products of British Hospitals. There is no doubt that Plastic Surgery here was started on a very solid foundation. These nursing personnel transferred their expertise to their colleagues through in-house seminars, ward supervision etc. We must pay our respect to them as their humble efforts are yielding fruits by the day.

Personnel development: There is no doubt that the volume of work and interest generated by this branch of surgery which was earlier misunderstood should attract the attention of young men and women. Hence Dr. F. C. Akpuaka now Professor was actually the first resident doctor in Plastic Surgery. He joined the service fresh from NYSC. Earlier slated for specialization in Internal Medicine, his young mind was captivated by what he saw in these pioneers. He made a right about turn and came to make his mark as an outstanding Plastic Surgeon, trainer and

examiner in Post-Graduate examinations. He also went to Britain to be further trained in the best traditions of the specialty. Dr. F. C. Akpuaka further encouraged younger colleagues to appreciate the specialty. After having served out his period as Senior Registrar to Drs Nwozo and Iregbulem, he was appointed a Consultant. He established the Clinical Meeting where matters of common interest in Orthopaedic, Plastic Surgery, Family Health etc were discussed weekly by the whole hospital community. He and Dr. I. Igboanugo (his Registrar) raised the first fascio-cutaneous flap for coverage of leg defects even before Ponten published his article in the British Journal of Plastic surgery in 1983. He went ahead to raise further flaps based on the same principle for coverage of elbow defects and this is now accepted as standard practice and is published in the Encyclopedia of flaps (Radial Recurrent Fascio-cutaneous Flap for coverage of Posterior Elbow Defects page 1219 of Grabb's Encyclopedia of Flaps, Upper Extremities) 2nd Edition. He resigned from the hospital and went into academics to rise to the present level of Professor.

After Dr. Akpuaka, came Dr. B.O. Uchendu again British trained. He worked after his residency training in Britain as a Senior Registrar here and rose to the level of Chief Consultant before his retirement. He was popularly referred to as "Omenka" i.e the Artist. There was also Dr. I. D. Onyia (Morgan) who trained in Britain as a Plastic Surgeon and rose to a Senior Consultant before retirement. He is in private practice at present.

Affiliation with WACS/NPMC: Dr. J.U. Achebe who rose eventually to become the Medical Director of the hospital was the 1st doctor to hold an indigenous fellowship here following his training under the aforementioned. He had his one year abroad training in Britain and came back to pass the WACS (West African College of Surgeons) examination in the Part 2 Fellowship. He is the 1st fellow of the West African College of Surgeons in Plastic Surgery.

Interlude: Dr. Achebe's pioneering effort as the 1st indigenous fellow in Plastic Surgery in 1989 apparently in the West African Region was the beginning of a deluge of fellows. Prior to this deluge, the hospital had suffered a severe setback of personnel occasioned by the severe economic depression of the early 90s. Most, if not all of our experienced Plastic Surgeons and trainers left for greener pastures either to Britain or the Persian Gulf. Dr. Achebe was now left as a young Consultant to nurture other aspiring fellows.

Mention must be made of the role played by Dr. B. O. Onabowale of blessed memory – an Orthopaedic Surgeon and then Medical Director who was at the helm of affairs within this trying period. He encouraged and propelled the young doctors to quickly fill the yawning gap. His enthusiasm not to allow the unit to collapse led to the emergence of Drs. Echezona, Nnabuko, Jiburum, Onyeador (Mrs), Ogbonnaya and Onah in quick succession. So the torch lit by Drs. Nwozo and Iregbulem has continued to be handed down to successive generations. Currently the above mentioned Consultants have sustained growth in the specialty as trainers and core service providers.

Residency training: The hospital is recognized for the training of Plastic Surgical Specialists by the National Post-Graduate Medical College and the West African College of Surgeons. Hence Part 2 Fellowship candidates have graduated through this hospital coming from various parts (East, West, North and South) of the country. These fellows have been inoculated with the spirit of Enugu Plastic Surgery. All are now assuming Consultant positions in their various Institutions, which are too numerous to mention. Specialty rotations are also offered to Residents in Ophalmology, ENT Surgery, Maxillo-facial Surgery and they have come from teaching hospitals around, for example, UNTH, Enugu, NAUTH (Nnewi), UCTH (Calabar), UPTH Port Harcourt) and Federal Medical Centres. There is no part of this country that has not been impacted positively by the Plastic Surgical Unit of the National Orthopaedic Hospital, Enugu.

The Regional Burns Centre: Dr. J.C. Nwozo, the pioneer Plastic Surgeon submitted a blue print of a modern Regional Burns Centre to government much earlier in the 1980s. This was never implemented. However, a five bedded burns unit was used to treat burns victims. It was attached to the casualty ward. Eventually, during Dr. Achebe's tenure as Medical Director work started at a location for the Regional Burns Centre. The buildings were commissioned in 2005 but have largely remained underutilized and poorly equipped. However the current Medical Director Dr. C.B. Eze has started the process of equipping the centre with intention of making it functional in no distant time. It is hoped that a Burns Centre befitting of this hospital will eventually come to be. However, the absence of a purpose built burns centre has not deterred the hospital from the provision of care for burns victims. It has remained a major referral centre for burn injuries in the Southern part of Nigeria. Various degrees of burns and associated deformities are managed here. Major burn disasters have had inputs from this centre. For instance, nurses from this centre were sent to various areas of Delta State during the Jesse fire disaster in the 1990s. They provided help in the management of the victims. Students of the Nnamdi Azikiwe University Awka, involved in major burns of their hostel were also rushed for treatment here.

School of Post Basic Nursing (Burns and Plastic Surgery).

In 1993, the Hospital established a school to train post basic nurses to complement the efforts of the plastic surgeons and to disseminate knowledge in the specialty. Every year, this school has graduated students from various parts of Nigeria. It is the only known school in the West African Sub-region offering this course and is accredited by the Nursing and Midwifery Council of Nigeria.

The Smile Train Programme: The hospital is a major collaborator with the Smile Train organization – a US based philanthropic body dedicated to providing free cleft surgeries in the developing world. Currently, the Plastic Surgical Unit has performed close to 250 cleft surgeries in the past two years.

Future trends: Slow but steady progress is being made. Scope and volume of work is increasing. We are aware of developments in the specialty and working assiduously to be participants in these trends. For instance, free flap (micro-vascular) surgery is in the pipeline. The hospital has acquired a modern operating microscope but technical manpower is being developed for it to becomes routine. Craniofacial Surgery is another area that is gradually gaining attention. Rudimentary inroads have been made but logistic problems are yet to be surmounted.

Conclusion: There is no doubt that a vibrant plastic surgical revolution is quietly going on, in Enugu. It started gradually and is spreading steadily. The scope of activities is far and wide. It ranges from reconstructive, aesthetic, craniofacial surgery – the light is shining and shall not be dimmed. Sir Harold Gilles may not have predicted that his vision would illuminate even the backyards of Enugu. That's what it has come to be. Thanks to the pioneering efforts of Dr. J.C. Nwozo and Dr. L.M. Iregbulem. I am optimistic that younger generations will sustain the excellent examples laid down by these predecessors as we steadily progress in the 21st century.

ANNOUNCEMENTS

Important NEWS

THE President of the Nigerian Association of Plastic, Reconstructive and Aesthetic Surgeons (NAPRAS), has given an executive approval to the request by the Editor of the Nigerian Journal of Plastic Surgery to stay action on the change of name of the Journal to "Journal of Plastic Surgery and Trauma" for logistic reasons

The 16th Annual General Meeting of the Nigerian Association of Plastic, Reconstructive and Aesthetic Surgeons (NAPRAS) will hold at Makurdi by October 2010.