RESEARCH PAPER

Patient's Self-Assessment of Social-Approval After Mandibulectomy with Disarticulation: the Necessity for Jaw Reconstruction Following Loss of Facial Symmetry in a Resource-Poor African Setting

Bayo Aluko-olokun¹ · Ademola A. Olaitan²

Received: 5 April 2016 / Accepted: 3 December 2016 / Published online: 16 December 2016
© The Association of Oral and Maxillofacial Surgeons of India 2016

Abstract

Objective Mandibulectomy with disarticulation is usually carried out without reconstruction in Low-Income-Countries. Lower standards of living are usually acceptable and adapted to, in poor societies. This study compares patient's self-assessment of social approval among reconstructed and non-reconstructed cases of mandibulectomy with disarticulation in a resource-poor African setting.

Material and Method This questionnaire-based study documented patient's self-assessment of social approval of themselves following mandibulectomy with disarticulation. 12 derived queries were administered on each patient, to test what they perceived of social acceptability of their facial features following mandibulectomy.

Results All 10 patients who underwent mandibular reconstruction reported that they felt confident engaging in all forms of social activity, while all 10 who had resection without reconstruction did not.

Conclusion The low social approval perceived by patients who have undergone mandibulectomy with disarticulation without reconstruction necessitates that surgeons must strive to reconstruct this anatomical region even under circumstances of severe resource-constraint. The culture in the third-world is not supportive of patients who have not undergone reconstruction following resection, in spite of being victims of all-pervading poverty.

Level of Evidence Level IV, investigative study.

Keywords Symmetry · Reconstruction · Social-approval · Mandibulectomy

Introduction

Mandibulectomy with disarticulation is usually carried out without reconstruction in Low-Income-Countries because most patients cannot afford the cost of osteosynthesis materials for rigid fixation [1]. Mandibular reconstruction restores facial aesthetics, which resection imperils as it introduces asymmetry. At stake is symmetry of the lips, which have been suggested to be the most critical anatomical region of the face on which judgment of attractiveness is based [2]. Symmetry is a cardinal characteristic of attractive faces [3]. Aesthetics and the coordinated movement of other structures in the lower third of the face are dependent on the presence of both mandibles which form the movable and inferior portion of the temporomandibular joint. This function enables mastication and speech, which may be imperiled when surgery involves the joint. This can have social consequences: being social is essential to being human, and socialization is possible only when an individual has no self-inhibitions, and is also acceptable to society.

As societal attitudes shape acceptability of the outcome of clinical events [4], it is worthy to investigate results of interpersonal relationships of patients who have undergone jaw resection in the third-world. Lower standards of living are usually acceptable and adapted to in poor societies [5]. This study compares patient's self-assessment of social-approval among reconstructed and non-reconstructed cases of mandibulectomy with condylar disarticulation in a resource-poor African setting (Figs. 1, 2, 3, 4, 5, 6 and 7).

✉ Bayo Aluko-olokun
balukoolokun@gmail.com

¹ Department of Facial Surgery, National Hospital, 312 Central Business District, Abuja, Nigeria

² Faculty of Dental Surgery, Lagos State University, Lagos, Nigeria

Methods and Patients

This questionnaire-based study was carried out at the Maxillofacial surgery unit following approval from Institutional Review Board (Ethics) Subcommittee of National Hospital Abuja Nigeria, in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments. It documented patient's self-assessment of social-approval of themselves following mandibulectomy with disarticulation.

Inclusion criteria were:

1. Age of patient must be between 18 and 45 years at time of surgery.
2. Mandibulectomy with condylar disarticulation due to presence of benign tumour involving vertical and horizontal rami, should have taken place at least 48 months prior.
3. Immediate mandibular reconstruction must have been done using autogenous bone graft held in place with polyglactin 910 suture material, in patients who have had reconstruction.
4. Reconstructed and non-reconstructed patients were paired with regards to type of tumour, location and size of surgical defect, as well as surgical route
5. Paired patients must have undergone mandibulectomy within 3 months of one another.

Informed consent was obtained from each patient.

Exclusion criteria were:

1. Patient without a counterpart for pairing with regards to type of tumour, location and size of surgical defect, as well as surgical route.
2. Patient without a counterpart with whom he/she underwent mandibulectomy within 3 months of one another.
3. Patients whose surgery involved excision of soft tissue.
4. Medically compromised patients, e. g diabetics, hypertensives, psychotics and patients on steroids or long-term medications.

A questionnaire was administered on each patient, to test what they perceived of social acceptability of their facial features following mandibular surgery.

Patients who underwent reconstruction were classified as group A, while those who did not (non-reconstructed) were classified as group B.

The questionnaire bore 12 queries which required answers were either "yes" or "no".

Comparison of the data obtained for both groups of lesion was done.

Data Analysis: Data was summarized using numbers and values of simple proportions.

Results

A total of 20 patients equally distributed to groups A and B participated in this study. 11 males with ages ranging from 25 to 43 and 9 females with ages ranging from 29 to 41 were included. All 20 had undergone surgery due to ameloblastoma. Table 1 shows the response of the patients.

Discussion

The results of this study indicate that the two categories of patient have starkly different social experiences following their contact with specialist surgeons, to solve essentially the same problem. The unreconstructed patients are shown to have a generally unpleasant post-surgical existence. All patients whose jaws were not reconstructed claimed to experience negative reactions from individuals in their communities, directly related to their misshapen face; those who underwent reconstruction had no such experience. This was the reason why Heffelfinger et al. [6] insisted that reconstructive surgeons must strive to attain lofty aesthetic goals for patients undergoing mandibulectomy. Life has been described as beautiful. But when the human, which represents it in its highest form, bears a face that is adjudged to be unattractive or devoid of beauty, an incongruous situation must be at play. The face is crucial for human identity; and it is generally desirable for humans to possess an attractive face or identity. Beauty or attractiveness, though a complex concept, is universally agreed to be a harmony of form and proportions [7]. This harmony which is disrupted by mandibulectomy, is restored by reconstruction. This underscores the importance of reconstruction. Beauty has always played a key role in human affairs. Contests were held regularly in Ancient Greece for both male and female. Beauty was greatly admired and individuals demonstrated very keen desire to win these contests [7]. This has hardly ever changed. It must therefore be an isolating and torturous experience for one to be trapped behind a face universally agreed to lack beauty. Torture is not beautiful. It is anti-human; as it is a basic human right to live a life free of torture [8].

All 10 patients who underwent mandibular reconstruction reported that they felt confident engaging in all forms of social activity, while all 10 who were not reconstructed, had reservations probably due to feelings of reduced self-worth or to avoid causing embarrassment to others. Urken [9] agrees with this finding, describing it as a historical phenomenon, probably because he did not have the African situation in mind. The goal of reconstructive surgeons is to return patients to their previous state of function [10, 11]. 60% of reconstructed patients

Table 1 Queries and patterns of responses from group A (reconstructed) and group B (non-reconstructed) patients

Questions	Group A		Group B	
	Yes	No	Yes	No
Do you feel confident engaging in all forms of social activity?	10	0	0	10
Do others talk about your face being beautiful?	6	4	0	10
Do you feel rewarded in any way in the community on account of having had mandibular surgery?	8	2	0	10
Did you return to work with confidence after surgery?	10	0	2	8
Do you think your facial features following mandibular surgery, are acceptable to members of your community?	10	0	3	7
Do you believe that the aftermath of surgery causes embarrassment when you eat in the presence of others?	0	10	6	4
Do others ask you to repeat what you have said more often than before the surgery?	0	10	5	5
Do you feel discriminated against in any way in the community on account of having had mandibular surgery?	0	10	8	2
Do you, at least on a monthly basis, experience negative reactions from individuals in your community on account of having had mandibular surgery?	0	10	10	0
Do others talk about your facial deformity?	0	10	10	0
Do you at least on a weekly basis, use scarves, mufflers or other clothing to camouflage tissue deficiency caused by mandibular surgery?	0	10	3	7
Do you often choose rather to stay at home than visit an interesting public place because of the consequences of mandibular surgery?	0	10	5	5

claimed to have experienced members of their community complimenting the beauty of their faces, while none of the unreconstructed experienced such. 7 (70%) patients who did not undergo reconstruction considered their facial features unacceptable to members of their society. None of those who underwent reconstruction felt the same way. This was the reason why Rana et al. [10] stated that an aesthetic outcome is a minimum requirement of reconstruction, even if it is a challenge. This challenge appears to have been beaten, despite the odds, in all reconstructed cases in this study.

Life and beauty may be threatened by the presence of a tumour involving the mandible; the former may be saved by resection of the tumourous bone; but mandibulectomy produces another problem—loss of harmony of form and proportions—with very serious psychological and social consequences. There is incontrovertible evidence that persons with facial deformity suffer severe social and economic discrimination. They are negatively stereotyped and receive disproportionately lower interpersonal outcomes. It is easy to see that they are disadvantaged with regard to economics and barriers to advances in society [12].

Without reconstruction, the same life, saved by mandibulectomy, may be perceived as not worth living, having lost aesthetic value. These consequences of non-reconstruction of a resected jaw need to be prevented.

50% of patients with unreconstructed jaws reported speech defects, while none reported same among their reconstructed counterparts. This indicates that reconstruction plays a role in speech restoration among mandibulectomy patients. This corroborates the assertion

by Shirani et al. [11] that speech articulation is a function for which mandibular reconstruction is required.

It is remarkable that the three parameters measured which produced 100% values among both groups of patients can make for a test of paranoia. It is unfortunate to find that the unreconstructed patient appears to suffer so much paranoid ideation when modified scales of Fenigstein and Vanable [13] and Gilbert and Allan [14] are applied to their response. The reconstruction of a resected jaw therefore can prevent a psychological deficit, as body image and self-esteem are not negatively affected. The result in this study shows that the benefitting patients enjoyed the freedom to associate without feeling inferior, having had their beauty restored and jaw function maintained including speech and feeding. They can be said to have been enabled to interact confidently, being unencumbered by a physically balanced body. Reconstruction therefore restores a patient's humanity, setting them free to contribute to their community. But patients in Low-Income-Countries regularly fail to have their resected jaws reconstructed because of poverty [1]. This afflicts the majority of humanity in the 21st century who inhabit Low-Income-Countries. They often would have hidden their faces due to unsightly tumourous swellings prior to surgery, but may post-surgically also remain home-bound, feeling socially awkward due to the tissue deficiency caused by jaw resection. This raises questions on the value of the life-saving tumour-ablating exercise, since the life thus saved may not be enjoyed without reconstruction.

Such patients may have their activities restricted to night time as reported in Ghana, where persons with facial deformities have been found to populate a market where

Fig. 1 Shows a patient's face at rest 84 months post-reconstruction, following right total mandibulectomy

Fig. 2 Shows profile of patient in *upper photographs*; teeth in occlusion and mouth-opened position in *lower photographs*, 84 months post-reconstruction

they trade only under the cover of darkness. They are often treated as outcasts [15]. The unrestored patient, along with his jaw, would have been excised from contributing to his community, and will only be a burden to it thereafter. This should not be the fate of persons who have had contact with specialist surgeons, for mandibulectomy. There is a wrong general impression that plastic surgical intervention is not cost effective [16]: But a cost cannot be put to life; and beauty promotes it. Surgeons therefore have a duty to restore beauty as it promotes the lives we undertake to preserve. As shown in this study, the culture in the third-

Fig. 3 Shows orthopantomograph of patient shown in Figs. 1 and 2, taken 84 months post-surgery. Resource-constraint necessitated use of polyglactin 910 suture material for internal fixation (with post-operative intermaxillary fixation) to reconstruct the whole of right mandible from autogenous iliac bone graft

Fig. 4 Shows a patient who has not had reconstruction following right total mandibulectomy

world appears not supportive of jaw-resected patients who have not undergone reconstruction, in spite of being victims of the all-pervading poverty. Reconstruction has a positive socio-economic impact, even as it helps the world become more beautiful. The restored patient is enabled to fully participate in building their part of the world and helping to break a vicious cycle of poverty prevalent in these parts of the world. Leaving their jaws unreconstructed reduces their chances of economic empowerment. The disabling effects of non-reconstruction of a resected mandible is evident in Table 1 which shows that eating, work, recreation and social interaction, among others, are negatively affected. Authors agree that mealtime accounts for much of our social interaction, therefore hindrances to participation such as speech and deglutition impairment increases the patient's isolation [9].

The Black race is believed to have a higher frequency of ameloblastoma which most commonly affects the posterior

Fig. 5 In clockwise direction starting from *upper left* position, orthopantomograph shows *right* mandible with ameloblastoma; another taken 2 days post-operatively; a third one taken after 4 weeks

showing *shadows* of perforations made for suture attachment around the body and angle of the reconstructed mandible; and a fourth one taken after 6 months showing evidence of healing and remodeling

Fig. 6 The replacement autogenous bone-graft assembled from 3 parts held together with polyglactin 910 sutures passed through perforations; intra-operative photograph showing graft held in place using same sutures for internal fixation

aspect of the mandible [17], often necessitating mandible resection with condylar disarticulation. This belief appears to be reflected, as all the patients eligible for participation in this study suffered from the same tumour. Application of appropriate technology using autogenous bone graft, which is usually in abundant supply, has helped rescue many faces.

In conclusion, the low social-approval perceived by patients who have undergone mandibulectomy with disarticulation without reconstruction necessitates that surgeons

must strive to reconstruct this anatomical region even under circumstances of severe resource-constraint as experienced in third-world countries. This can serve as our contribution to the uplift of the less fortunate majority of mankind. Surgeons must also, in spite of work pressure, take time to counsel patients before ablative procedures, so as to prepare them to tolerate and endure nuances of ignorant society. Mass education of the public, possibly using mass media, is necessary to inculcate respect and love for all human life-forms.

Fig. 7 Shows facial features of patient whose mandible was shown in Figs. 5 and 6

The authors advocate that Governments in Low and Middle Income Countries pay closer attention to encouraging the provision of adequate plastic surgical procedures employing appropriate technology, as this can help in nation-building. Increased output will ultimately lead to higher demand for conventional treatment.

Compliance with Ethical Standards

Conflict of interest None.

Informed Consent Consent for inclusion in this study was given by all patients.

Ethical Statement This study has been carried out in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments.

References

1. Obiechina AE, Ogunlade SO, Fasola AO, Arotiba JT (2003) Mandibular segmental reconstruction with iliac crest. *West Afr J Med* 22(1):46–49

2. Aluko-Olokun B, Mike-Ogiassa RI, Olaitan AA, Aluko-Olokun OA (2014) Predisposing factors, clinical presentation and outcome of treatment of avulsive human bites on the face: a case series analysis from Abuja, Nigeria. *Eur J plast surg* 37(10):523–528. doi:10.1007/s00238-014-0981-1
3. Springer IN, Wannike B, Warnke PH et al (2007) Facial attractiveness: visual impact of symmetry increases significantly towards the midline. *Ann Plast Surg* 59:156–1628
4. U.S. Department of Health and Human Services (2001) Mental health: culture, race, and ethnicity—A supplement to mental health: a report of the surgeon general. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, Rockville
5. Eurostat (2015) European working conditions observatory. Income poverty in the European Union. http://www.eurofound.europa.eu/ewco/surveyreports/EU0703019D/EU0703019D_3.htm. Accessed 1 Jan 2015
6. Heffelfinger RN, Malhotra PS, Fishman MA (2008) Aesthetic considerations in mandibular reconstruction. *Facial Plast Surg* 24(1):35–42. doi:10.1055/s-2007-1021460
7. Goisis M (2014) Injections in aesthetic medicine. Springer, Berlin
8. United Nations (2015) The universal declaration of human rights. Article 5. <http://www.un.org/en/documents/udhr/>. Accessed 3 Jan 2015
9. Urken ML (2012) Foreword. In: Urken ML (ed) Multidisciplinary head and neck reconstruction: a defect-oriented approach. Lippincott Williams & Wilkins, Philadelphia
10. Rana M, Warraich R, Kokemüller H et al (2011) Reconstruction of mandibular defects-clinical retrospective research over a 10-year period. *Head Neck Oncol* 3:23. doi:10.1186/1758-3284-3-23
11. Shirani G, Arshad M, Mohammadi F (2007) Immediate reconstruction of a large mandibular defect of locally invasive benign lesions (a new method). *J Craniofac Surg* 18(6):1422–1428
12. Tobiasen JM (2006) Craniofacial psychology: new directions. In: Berkowitz S (ed) Cleft lip and palate: diagnosis and management, 2nd edn. Springer, Berlin, p 262 (**Chapter 11a**)
13. Fenigstein A, Vanable PA (1992) Paranoia and self-consciousness. *J Pers Soc Psychol* 62:129–138
14. Gilbert P, Allan S (1994) Assertiveness, submissive behaviour and social comparison. *Br J Clin Psychol* 33:295–306
15. Agbenorku P, Agbenorku M, Iddi A, Abude F, Sefenu R, Matondo P, Schneider W (2011) A study of cleft lip/palate in a community in the South East of Ghana. *Eur J Plast Surg* 34(4):267–272
16. Jabir S (2014) Global health inequalities in plastic surgery—addressing the imbalance. *Eur J Plast Surg* 37(4):253–254
17. Sawyer DR, Mosadomi A, Page DG, Svirsky JA, Kekere-Ekun AT (1985) Racial predilection of ameloblastoma? A probable answer from Lagos (Nigeria) and Richmond Virginia (USA). *J Oral Med* 40:27–31