

Full Length Research Paper

Mandibular resection: a prospective analysis of morbidity and mortality in Zaria, Nigeria

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Mandibular resection is a common treatment modality adopted in managing some malignant and benign lesions involving the mandible. The extent of the resection no doubt has some aesthetic and functional consequences. A prospective study of 177 mandibular resections done at MFU, ABUTH, Zaria from 1996–2007 was undertaken. A review of the common indications for mandibular resection and analysis of the degree of impairment of mouth functions was done. Patients' attitude to life postoperatively as evidence by change in life style and occupation was equally assessed. Though mouth functions – mastication, speech, swallowing and sensation were adversely affected in the immediate postoperative period, some level of recovery took place later that enabled the patients live near normal lives. The social intercourse of the patients with relations, friends and colleagues at work was most encouraging as majority of the respondent indeed resumed their pre-operative life style shortly after their operations.

Keywords: Aesthetics, functional, malignancy.

INTRODUCTION

Complications following surgical ablation of jaw tumours have been a problem to the oral and maxillofacial surgeons and his team ever since the first successful surgery was done in 1810. The goal of the team has not only been to eradicate diseases but also to rehabilitate their patients to continue living normal lives.

The mandibular surgical procedures studied ranged from simple dentoalveolar resection to hemimandibulectomy and total mandibulectomy. Dentoalveolar resection involved excision of variable amount of dentoalveolar structures with preservation of the lower border/basal bone of the jaw. Varying amounts of full thickness of the jaw may be resection

ranging from a few centimeters to total jaw resection with disarticulation of temporomandibular joints and excision of adjoining soft tissues.

A complication is considered to have arisen when the healing process is altered and a new situation is inserted into the post operative course that required remedial medical or surgical action. The complications encountered in major jaw resections are to a large extent unavoidable since the functional integrity of the lower one-third of the face is borne primarily by the mandible. The severity of the complication depends therefore on the type and extent of mandibular surgery.

The study prospectively examined the post operative complications following ablation of mandibular tumours and the level of social reintegration of the patients into local communities as seen at the MFU, ABUTH, Zaria from 1996 to 2007.

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Table 1. Distribution according to age of 177 cases of mandibular resection

AGE (YEARS)	No. OF PATIENTS	PERCENTAGE (%)
0 – 10	6	3.39
11 – 20	49	27.68
21 – 30	59	33.33
31 – 40	42	23.73
41 – 50	12	6.78
51 – 60	9	5.08
Total	177	100

Table 2. distribution according to histological diagnosis

DIAGNOSIS	No. OF PATIENTS	PERCENTAGE (%)
Ameloblastoma	103	58.19
Fibro-osseous Lesion	33	18.64
Fibro-Myxoma	19	10.73
Ameloblastic Fibroma	4	2.26
Osteosarcoma	4	2.26
Chondrosarcoma	3	1.69
Haemangiopericytoma	3	1.69
Malignant Fibrohistiocytoma	3	1.69
Rhabdomyosarcoma	3	1.69
Verucous Carcinoma	1	0.56
Fibrosarcoma	1	0.56

MATERIALS AND METHODS

Prospective analysis of morbidity and mortality following mandibular resections in 177 patients was done. Maxillofacial examination was done to determine site and extent of lesion, associated lymph nodes and the appropriate surgical approach. Patients were routinely investigated to ascertain their fitness for planned procedures. The diagnoses of the mandibular lesions were established in all cases by histological examination.

Intra-operative complications were recorded where they occurred and patients were examined in the immediate post-operative period, at six weeks, 3

months, 6 months and yearly, for presence of complications and possible recurrence.

Antibiotics was commenced in the immediate post-operative period and continued for one to two weeks or longer in cases of persistent wound suppuration as shown by microscopy, culture and sensitivity. Adjunctive chemotherapy was administered in 18 of the patients post-operatively.

A questionnaire was designed and divided into two sections A and B. The subdivisions in section A respectively analyzed the personal data, diagnoses, extent of surgery, adjunctive therapy, anesthetics technique and the intra-and post-operative complications observed in the cases. Section B contains patients' and authors' assessment of the outcome of surgery and adaptation back into the society. The patient's reactions to outcome of surgery were graded as poor, satisfactory and very good result according to Vaughan's modification of Visick's grading system used for assessing the results of peptic ulcer surgery.

Similarly, the authors objectively assessed the patients as poor, satisfactory and very good result. Social adaptation was measured by asking the patients how well they had adapted using Adler's recovery scale as modified by west.

RESULTS

A total of 177 patients consisting of 93 males and 84 females were reviewed in this study. 114 were married while the rest were unmarried, working or schooling. 59 patients (33.33%) were aged between 21–30 years while 6 patients (3.39%) were below 10 years of age (table 1).

The patients came from 19 different ethnic groups. 101 patients were of Hausa-Fulani fraction while the rest came from the other ethnic groups in the country with the least number (six) coming from the Ijaw race in the South-south.

71 patients were unskilled/outdoor workers made up of farmers, traders, nomads, drivers, security men, operators, welders and cooks. Students were 52, housewives 33, while 21 made up of skilled workers/self employed made up the list.

Table 2 shows the different tumours that were the reasons for mandibular surgeries/procedures. Ameloblastoma constituted the most frequent reason

Table 3. Distribution according to different modalities of treatment used in managing 177 patients

TREATMENT MODALITY	NUMBER OF PATIENTS	PERCENTAGE (%)
En-bloc Resection	38	21.46
Anterior Arch Resection	16	9.04
Posterior Segmental Resection	49	27.68
Heminmandibulectomy	52	29.38
Subtotal and Total Mandibulectomy	22	29.38

Table 4. Postoperative participation levels of the 177 cases in formal and religious organizations

LEVELS OF PARTICIPATION	FORMAL ORGANIZATION (%)	PERCENTAGE (%)
Increased	23 (13)	28 (15.82)
Decreased	41 (23.16)	33 (18.64)
No Change	93 (52.54)	116 (65.54)

Table 5. Postoperative interaction with relatives and friends

LEVEL OF PARTICIPATION	VISIT TO FRIENDS	VISIT BY FRIENDS	VISIT BY RELATIVES	VISIT BY RELATIVES
Increased	28	52	39	67
Decreased	40	23	33	43
No Change	109	102	105	67

for mandibular surgery in our study group. Overall, more cases of mandibular resection were done due to benign tumours rather than for malignant tumours. Deforming grotesque lesions were in the majority of the lesions treated. This is largely because our patients presented late. The earliest presentation in our series was at 12 months of onset of jaw swelling. At the other extreme, a jaw resection was carried out to remove 14 years tumour. On the whole, 91 patients (51.41%) presented within the first 5 years of tumour development.

The extent of surgery in the 177 cases depended on the tumour type (as shown by histopathology), site and size. 38 (21.46%) patients had excision of tumours with encompassing dentoalveolar structures and preservation of the lower border of the mandible. 16 (9.04%) had resection of the anterior mandibular arch, full thickness segmental resection was carried out in 49

(27.68%) patients, while 52 (29.38%) patients had hemimandibulectomy. Postoperative complications noted included reactionary haemorrhage (2.2%), wound breakdown (7.34%), wound infection (10.73%), orocutaneous fistula (1.69%) and facial nerve palsy (0.56%).

Participation in social activities like clubs and other formal organization's increased or remained same postoperatively in over 65% of the respondents. There was decreased participation in about 31.16% of cases. 28 patients said they increased their levels of involvement as prior to surgery.

Our study also revealed that the level of interaction with friends and relations did not change significantly after surgery. While majority received warmth and sympathy from friends and relatives, few however suffered some form of rejection for fear of their diseases being contagious.

DISCUSSION

The two objectives of this study which are to determine the degree of impairment of mouth function; and the level of patients' reintegration back into the society have been subjectively and objectively analyzed.

It is seen from the analysis of duration of tumour at time of presentation that most of the cases (51.41%) presented at least one year after the onset of lesion. A critical analysis will reveal that majority of these patients presented from 3 – 5 years after onset of diseases. In effect then, more than 70% of our cases present with advanced lesions that leave quite noticeable defects and deformities postoperatively.

Leakage of saliva was noted in all the patients in the immediate postoperative period. Control of salivary secretions however was regained within 3 -5 days postoperatively. Salivary leakage was due to inability of patients to swallow saliva as a result of trauma from endotracheal intubation, nasogastric tube discomfort, diminution of volume of oral cavity due to dentoalveolar and soft tissues loss; and marked postoperative oedema of the tongue and floor of the mouth. This observation agrees with the finding of Smith and Goode (1970)⁵, that failure to swallow salivary secretions or inability to retain accumulated secretion is significant in the genesis of drooling of saliva.

All the patients experienced difficulty in swallowing in the immediate postoperative period varying from few days to one week. Poor swallowing noted in 4 (2.26%) patients is similar to earlier observation of 3% incidence of difficulty in swallowing recorded by Adekeye & Apapa (1987)⁶. The good result noted in swallowing was due to sparing of the tongue, large part of the floor of the mouth, the walls of the oropharynx and the larynx during the operative procedures. The result agrees with Frank (1974)⁷ and Prince's (1984)⁷ who remark that swallowing is a primary function and ability to swallow usually returns after a while following surgery. Couley (1960)⁹ stated that mandibular resection created only mild handicap is swallowing which is overcome in an interval of two or three weeks. Motivation of the patients contributed a lot of quick recovery of the swallowing act.

Speech was considered poor in 11 (6.21%) patients. This observation is lower than 26.66% recorded previously in our unit by Adekeye and Apapa (1987) and far less than 44% in Vaughan's (1982) report. The low incidence is probably the result of limited interference with the articulating mechanism and the resonating

chambers, a view supported by the fact that poor speech was recorded in 11 patients that had extensive resection of hard and soft tissues. It is equally believed that the findings were affected by the low literacy level of the patients in our study group. A 10% incidence of temporomandibular joint dysfunction/pain was recorded. This result may have been due to fair to good occlusion and mastication seen in our patients as a result of stabilization of mandibular remnant postoperative with eyelet wires. In another 14.75% of these patients there were complaints of pain resulting from the superior-lateral pull of the posterior mandibular segment into the maxillary buccal sulcus.

Poor occlusion was observed in 33.61%. The result compares FAVOURABLY with 40% recorded by Adekeye and Apapa (1981). The poor occlusion was noted in patients that had extensive soft and hard tissue resection.

Marchetta (1976)¹⁰ pointed out that if one compared diets with postoperative diets in cases undergoing surgery for head and neck tumours, there is frequently little difference. The findings of confinement to purely liquid diets in 21.32% of our cases supports this claim, as all these patients had subtotal or total mandibulectomy without any form of reconstruction. Though the result differs from those of Vaughan (1982); and Adekeye and Apapa (1987), the difference could have emanated from the limitation of this study to patients who had mandibulectomy.

Weight was significantly affected in 17 patients due mainly to the wasting of their primary diseases and possibly to change in diet.

Mastication is a learned, volitional and automatic process which can often readjust following surgery (Cantor and Curtis, 1971)¹¹. Difficulty in mastication of meat, soft bone and sugarcane was noted in 23 cases while mastication was adjudged satisfactory or good in 84 patients. In the 15 patients that had subtotal or total mandibulectomy without any form of reconstruction, mastication was completely absent.

Good wound approximation and closure; limited soft tissue resection and aseptic surgical techniques resulted in minimal scar tissue formation. This led to wide range of mandibular movements in majority of the cases.

Disruption of taste sensation is a rare sequela of mandibulectomy¹² and was not recorded in any of our patients. None also reported disruption of sense of smell. The result here supports Vaughan's (1982)

finding that the incidence of taste affection is highest in those who had radioactive implantation, external beam therapy and finally surgery, particularly of the tongue.

An assessment of the adaptation patterns of these patients postoperatively in terms of changing life style and or occupation was made. Comparing post surgical with pre-surgical attendance at social gathering and formal group meetings, 41 patients actually reduced their attendance at such gathering. Of this number, 8 did so because of their new appearances; these were young ladies who had grotesque lesions excised leaving large defects without any form of reconstruction. This agrees with Rado's (1951)¹³ findings which noted that the sense of helplessness and cry for love were the motivating factors for the level of participation achieved postoperatively. Participation obviously enabled the patients to build up self confidence and enjoy the company of other people.

High level of religious activity was observed in majority of the respondents as about 80% either maintained or increased their preoperative levels of worship. The high level of worship/religious activities in these patients was an indication of their belief that only God/Allah could save them from "perceived imminent death" (Cantor and Curtis, 1971). It is worth noting that people were much more inclined to attending places of worship than clubs and formal organizations.

A look at the job description of 58% of the cases working prior to surgery shows that majority of these patients belonged to the low socio-economic class and were self employed. It was not surprising therefore that only 3 patients stopped work due to ill health. None changed occupation after surgery. This result lends credence to Adekeye and Apapa's (1981) argument that physical demand rather than age, speech problems and appearance, is the important factor that influences change of occupation in people from the low socio-economic class.

In assessing level of socio intercourse postoperatively, interaction at school with mates, association at home with co-housewives, and at work places of work with colleagues, with co-traders and associates were evaluated. The results shows that patients resumed their preoperatively level of interaction at school, homes and places of work and even in the market places. The sympathy and love received from others probably circumvented severe anxiety, depressive stupor and diffuse hostility said to be

present in patients who had mandibulectomy Cantor and Curtis (1971).

Visitation patterns of the respondents to friends and relatives and vice versa remained stable postoperatively in majority of the cases. The finding compares very well with earlier findings of West (1977), Adekeye and Apapa (1987). The results show that facial disfigurement very minimally affected visiting patterns with friends and relatives thus supporting West (1977) that friendships are flexible to the demands placed on them to the extent that relationship can be adjusted to fit new social developments and health limitations. The results also agree with Adekeye and Apapa (1987) that the general tendency of the extended family system to care for and encourage the afflicted are important contributory factors to good social intercourse.

The impact of facial disfigurement and functional impairment on married and unmarried patients was assessed. Twenty patients were unmarried for various reasons including age and schooling. Of their 8 females who were engaged prior to surgery, one was rejected by the fiancé because of fear of possible "imminent" death as the lady had two previous surgeries. The rest 12 patients, all males were neither married nor in any engagement. The reason given by these patients for not being married was financial constraint rather than disfigurement. There were 9 incidences of separation out of 118 patients who were married prior to surgery. West (1977) in a similar study reported separation of divorce in 6% of his cases noting that formal and informal relationship are only slightly disturbed by disfigurement following surgery and that where relationships were disturbed, appearance was rarely given as a reason. From the cases studied here, the response showed that aesthetic and functional disabilities from mandibular resections neither influenced chances of getting life partner nor significantly affected marital relationships.

CONCLUSION

The mandible offers the skeletal support and gives shape to the soft tissues of the lower one third of the face. Tumours involving the mandible that necessitated removal of major portion of it led not only to distortion of the aesthetics but also affected to a reasonable extent mouth functions.

The social intercourse of the patients remained remark-

ably high postoperatively as the empathy and the communal way of living in our environment encouraged the patients to reintegrate back into the society.

There is need however to increase the literacy and awareness of our people, to the need to report/seek medical attention early enough. The morbidity following mandibular surgery from our study is very minimal when the patients present early enough.

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