Oral Rehabilitation After Mandibular Free Fibula Flap Reconstruction: first stage audit

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Introduction

Extensive mandibular defects after surgery can negatively affect patient's quality of life by their inability to eat, drink, swallow, talk and altered facial appearance. The aim of this audit is to investigate what the current outcome for oral rehabilitation for this specific patient group at Moriston Hospital.

Gold standard

There was no known gold standard available trough the NICE guidelines or associations, therefor a gold standard was inspired from research performed by Garett et al.[1] regarding who prospectively investigated how many patients received either conventional prosthesis or implant supported prosthesis after mandibular resection with fibula reconstruction and their failure rate. They included 46 patients of whom 72% (33/46) received a conventional prosthesis and 35% (16/46) received an implant supported prosthesis. Failure was defined as (1) patient does not use prosthesis frequently during eating and (2) implant supported prosthesis became tissue supported. The failure rate was 6%.

From this the following gold standard was derived: *'At least 94% of the patients accepted their prosthesis and use it during eating and for the implant supported prosthesis it did not became tissue supported.'*

Materials and Methods

Consecutive patients who underwent mandibular resection with free fibula reconstruction between January 2015 and December 2018 were included in the audit.

Various data was collected from the perspective of Oral & Maxillofacial Surgery and Restorative Dentistry. See supplement I for the collected data and the data collection sheet.

For the mandibular resection classification we choose Brown et al[2] because this resection classification incorporated various other resection classifications.

Results summary

Between January 2015 and December 2018, 25 patients were identified through the Maxillofacial Laboratory data base –each of these patients had customised 3D planning and 3D cutting guides designed and underwent mandibular resection and reconstruction with fibula free flap. Of these 25 patients, 5 patients died shortly after the initial operation due recurrence (<8 months) and 3 patients had flap failure either perioperative or postoperative (1 patient passed died and had flap failure) and were excluded for further analysis in this audit.

The characteristics of the remaining 18 patients were as follow; 13 (72%) were male and 5 (27%) female. The initial diagnosis were 12 (67%) squamous cell carcinoma (SCC), 4 (22%) osteoradionecrosis (ORN) who completed radiotherapy respectively between 4-8 years earlier due SCC, 1 (6%) desmoplastic fibroma and 1 (6%) sarcoma (peripheral malignant nerve sheath tumour).

All patients with SCC had a T4a tumour involving the mandible and also 8 (92%) had an unilateral neck dissection and 1 (8%) bilateral. Regarding adjuvant treatment; 7 (75%) patients received postoperative radiotherapy and 6 (50%) postoperative chemotherapy while 2 (17%) had received preoperative chemoradiotherapy with the time between chemoradiotherapy and mandibular resection was 4 to 37 years.

Mandibular resection classified according to Brown was as follow: class I 9 (50%), class Ic 1 (6%), class II 4 (33%), class IIc 1 (6%), class III 1 (6%), 2 class IV (11%). Preoperative patients had average 17.3 sound teeth and postoperative 15.3 teeth with 5 opposing pairs of teeth and 2.4 teeth average being in the resected segment.

Of the 18 patients, 4 (22%) patients did not require further oral rehabilitation after the fibula reconstruction by restorative dentistry because the mandibular resection was largely outside the tooth bearing area- they all had a post resection adequate dentition and satisfactory oral function.

For 2 (11%) patients out of the 18 patients oral rehabilitation by restorative dentistry was not possible due pre-existent restrictions. 1 (6%) patient was not offered restorative rehabilitation because he had a permanent PEG after a previous SCC 5 years earlier which was treated with chemoradiotherapy and subsequent limited oral function. 1 (6%) patient had severe trismus and microstomia whereby restorative dentistry input was not possible – she had a SCC 4 years ago which was resected with close margins and developed recurrence requiring two additional resections and received chemoradiotherapy which subsequently lead to developing of chronic trismus and microstomia despite coronectomies and multiple cheiloplasties and finally developed ORN for which mandibular resection with fibula reconstruction was required.

Currently 2 (11%) out of 18 patients have finished their main treatment modalities (resection, reconstruction and adjuvant therapy), however 1 (6%) patient developed a recurrence and 1 (6%) patient became medically very unwell and has been admitted in the last few months in hospital and may not fit for further oral rehabilitation.

10 (56%) out of the 18 patients needed further oral rehabilitation and where referred to restorative dentistry, of which 1 patient declined further treatment. From the remaining 9 patients, 7 patients were satisfactorily rehabilitated by restorative dentistry, 1 patient will be receiving implants soon and 1 patient has been referred to restorative dentistry.

The average time between initial operation and referral to restorative dentistry was around 11 months, the average time for oral rehabilitation by restorative dentistry was around 7 months and therefore average time from operation to completion of oral rehabilitation was around 19 months.

Of the 7 patients who were oral rehabilitated, 6 out of 7 patients were eating solid food, had good swallow function and good speech. 1 out of 6 patients developed a SCC recurrence after she received 4 implants, subsequently lost 2 implants but her prosthesis remained implant supported. Her oral function was however limited, she eats soft food and swallowing and speech was difficult for her. The patients who underwent oral rehabilitation by restorative dentistry had preoperative an average of 12.4 sound teeth and postoperative 10 teeth with 2 opposing pairs of teeth and 3 teeth were in the resected segment.

Of the 7 patients who have completed oral rehabilitation, 3 patients received an implant supported prosthesis and 4 patients received a tissue/tooth supported prosthesis. The 3 patients who received an implant supported prosthesis, received each 4 implants, of which 2 patients had 2 implants failing, which leads to an implant success rate of (8/12)*100% = 66.7%. None of the implant supported prosthesis became tissue supported. All patients wear their prosthesis frequently.

Conclusion

Of the 18 patients who underwent mandibular resection with fibula reconstruction, 4 patients had adequate oral function after the initial operation, 2 patients had pre-existent long standing poor oral function before the initial operation and oral rehabilitation by restorative dentistry was not possible and patients have finished their main treatment modalities but currently have recurrent disease or medical issues which need to be dealt with first. 8 patients were referred to restorative dentistry for further rehabilitation of which 1 patients declined, 7

patients were satisfactory oral rehabilitated according to the gold standard criteria and 2 patient is currently planned for rehabilitation. Of the 7 patients 2 patient however has limits on her oral function due only being able to eat soft food with limitations on swallow function and speech.

The low patients numbers in this audit make reliable statistical analysis not possible. The gold standard was set for 96% which was reached 100% (7/7).

References

1. Garett et al. Efficacy of conventional and implant-supported mandibular resection prostheses: Study overview and treatment outcomes. July 2006. The Journal of Prosthetic Dentistry
2. Brown et al. A new classification for mandibular defects after oncological resection. Vol 17 January 2016. Lancet Oncology

Supplement I Data collection sheet

Oral rehabilitation after mandibular reconstruction with free fibula flap audit – inclusion form V2

General

Audit number:
Date of inclusion
Date of birth:
 Sex: M / F

Oral & Maxillofacial Surgery

Primary diagnosis Other / Cyst / SCC
TNM: 7th / 8th T N M
Operation date
Mandible segmental resection: [1] Class I / Ic / II / IIc / III / IV / IVc

Teeth present preoperative and extracted:

Neck dissection performed: Unilateral / bilateral; level I – II - III – IV – V; saving of N. XI / JV / SCM

Radiotherapy: preoperative / postoperative / date of completion
Chemotherapy: preoperative / postoperative / date of completion:
Other co morbidities:
ASA:

Smoking and pack year: No / preoperative – postoperative / pack years:
Alcohol: No / preoperative / postoperative – units/week:
Patient alive / diseased / alive with disease
Performance score / co morbidities score preoperative

Restorative dentistry

Restoration offered/needed Y/N; patient accepted Y/N
Date starting rehabilitation:
Date completing rehabilitation:
Intermediate restoration Y/N and what type
Long term restoration: Implant / tissue supported / other

Implant type:
Number of implants:
Implant failure:

Eating PEG / liquid / soft / hard
Swallowing
Speech
Patient experienced problems:

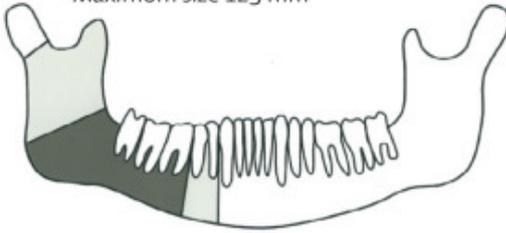Restoration/prosthesis accept by patient Y/N
Restoration/prothesis used frequently by patient Y/N
Implant supported prosthesis became tissue supported Y/N
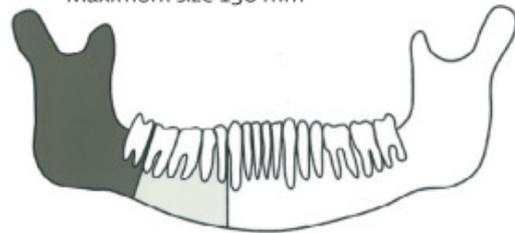Patient satisfactory oral rehabilitated: Y / N

Class I
Lateral not including canine or condyle
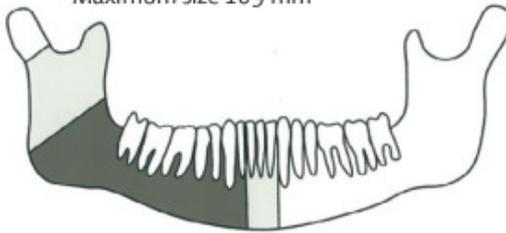Mean size 70 mm
Maximum size 123 mm

Class Ic
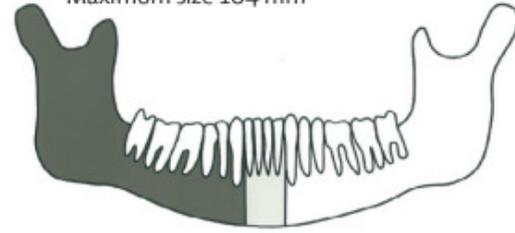Lateral with condyle
Mean size 84 mm
Maximum size 138 mm

Class II
Hemimandibulectomy includes ipsilateral canine
Mean size 85 mm
Maximum size 169 mm

Class IIc
Hemimandibulectomy and condyle
Mean size 126 mm
Maximum size 184 mm

Class III
Anterior includes both canines
Mean size 100 mm
Maximum size 160 mm

Class IV
Extensive includes canines and angles
Mean size 152 mm
Maximum size 282 mm

Class IVc
Extensive includes canines, angles, and condyles
Mean size 168 mm
Maximum size 312 mm