TREATMENT OUTCOMES OF RECONSTRUCTION WITH ILIAC BONE GRAFT AND RIB GRAFT IN PATIENTS WITH MANDIBULAR DEFECTS

1SHAHEEN ANJUM, BDS, FCPS (Oral Surgery)
2NADEEM AHMAD KHAN, MBBS, MCPS, FCPS (Anesthesiology), MSC (Pain Medicine)
3MUNIR AHMAD, MBBS, DA, FCPS (Anesthesiology), MSC (Pain Medicine)

ABSTRACT

Iliac bone graft can be used to reconstruct alveolar defects or bone defects under 5 cm. Rib grafts have proven ideal for condylar reconstruction. Objective of this study was to assess the functional and aesthetic outcomes and post operative complications of the reconstructive method. In this study iliac bone alone or combined with rib graft was used for reconstruction of mandibular defects. Sampling technique was non probability purposive. This study was conducted in the Department of oral and maxillofacial surgery, Nishter Institute of Dentistry, Multan from March 2010 to march 2012. A total of 15 patients of hemimandibulectomy were reconstructed by iliac bone alone or combined with rib bone graft. In 3 cases iliac bone was combined with rib bone graft. There were 6 (40%) male and 9(60%) females. Mean age was 23.86+2.69y (range 20 -30y). There were no significant post operative complications. Reconstruction with iliac bone graft combined with rib graft is an excellent method of reconstruction in patients with mandibular defects.

Key Words: Hemimandibulectomy, iliac bone graft, rib graft, reconstruction mandible defects.

INTRODUCTION

Autogenous bone grafts harvested in the iliac crest and rib are nonvascularized grafts. Iliac bone can be used to reconstruct alveolar defects or bone defects of less than 5 cm. The graft is shaped and it’s cortex is perforated at multiple sites to enhance vascularity and eventual resorption. The rib can be shaped according to requirement and is proven ideal for condylar reconstruction.

Free bone grafting was the first method of reconstructing mandibular defects and was initially reported by Bardenheuer in 1881. The first step in undertaking mandibular reconstruction involves careful evaluation of the patient’s anatomy in order to define the full extent of the existing or proposed defect. Both bony and soft tissue components must be examined so that the surgeon can conceptualize the tissue components which require reconstruction. Defects which are lateral and limited to the mandibular body often cause only minimal cosmetic and functional deformity. Patients may compensate for lateral defects and reconstruction may not be necessary. With increasing extent of bony loss, however, severe functional and cosmetic deformities result which necessitate reconstruction in order to restore quality of life. Furthermore, when evaluating defects that involve the mandibular ramus, it is important to note if the patient has a proximal segment of bone, a functioning temporomandibular joint, or a condylar neck to which the graft may be secured.1

METHODOLOGY

The study was descriptive and sampling technique was non probability purposive. It was conducted in the department of oral and maxillofacial surgery, Nishter Institute of Dentistry Multan from March 2010 to march 2012. Mean follow up was of one year. A total of 15 patients of hemimandibulectomy were reconstructed by iliac bone alone or combined with rib bone graft. In 3 cases iliac bone was combined with rib bone graft. In 12 cases iliac bone alone was grafted. All cases were
Mandibular defects reconstruction

operated for ameloblastoma. In 6 cases mandibulectomy was performed with disarticulation. In 9 cases only segmental resection was done. Functional assessment was performed by observing mandible deviation while opening mouth, and pain during movement of jaws. Outcome were infection, graft resorption, bone exposure due to soft tissue deficit, bone necrosis (partial necrosis >50% loss total necrosis, total bone loss) facial symmetry, donor site morbidity as gait disturbance, sensory loss, pleural tear, and delayed healing.

**RESULTS**

Patients were reconstructed by iliac bone or iliac bone combined with rib graft. There were 6 (40%) male and 9 (60%) females. Mean age was 23.86±2.69y (range 20-30y). Mean follow up was one year. In 6 (40%) patients graft was placed by extraoral approach and in 9 (60%) by intra oral approach. Operated wound healed in a mean period of 2 weeks. (For complications and gender distribution see Table 1 and Fig 1).

**DISCUSSION**

Oro mandibular reconstruction represents an exciting and growing area within head and neck reconstruction. The most common indication for mandibular reconstruction in our environment is excision of neoplastic lesions in the orofacial regions. A graft takes rate of 100 percent was achieved in this study. Some authors have reported lower success rate for free autogenous iliac crest as (Kudo et al 2006) reported bony union was achieved in six of eight patients using an autogenous iliac bone graft, a success rate of 75 percent. However Obiechina reconstructed twenty patients of hemimandibulectomy with free nonvascularised iliac crest. There was only one failure. 95% success rate was found that is consistent with findings of the present study (100%). The high percentage of graft incorporation in the current study may be due to a low incidence of infection and short span of graft length (mostly 9cm or shorter) with no post operative irradiation, as most of the indications for mandibular resection were ameloblastoma.

Graft site infection was found in one of the patients in this study with overall incidence of 7.0 percent. The infection was superficial and responded to antibiotic use. This infection was due to salivary contamination as in this case intraoral incision was used for graft placement. It was also found that no graft failure developed in any patient of this study. Facial asymmetry was found in one (7%). It was due to soft tissue loss on ascending ramus.

**TABLE1: COMPLICATIONS AND OUTCOMES OF GRAFTS**

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. of patients affected (n=15)</th>
<th>Outcome</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early</td>
<td>Late</td>
<td></td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>1</td>
<td>—</td>
<td>Healed</td>
</tr>
<tr>
<td>Resorption of graft</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Tumour recurrence in graft</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Nil</td>
<td>12</td>
<td>12</td>
<td>—</td>
</tr>
<tr>
<td>Facial asymmetry</td>
<td>1</td>
<td>—</td>
<td>Remained</td>
</tr>
<tr>
<td>Infection of graft</td>
<td>1</td>
<td>—</td>
<td>Eradicated</td>
</tr>
<tr>
<td>Graft necrosis</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Donor site morbidity</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Gait disturbance</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sensory loss</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Delayed healing</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
In this study, donor site complications were few. None of the patients of the present study developed incisional hernia, scar problem, gait disturbance, disfigurement, and donor site infection. It was due to strict post operative instructions about avoiding negative pressure. High success is also described by Karagoz who reported 6-year follow-up results of a patient who had undergone hemimandibulectomy and mandible reconstruction with free vascularized fibular flap, costochondral rib graft to restoration of the temporomandibular joint, and iliac bone graft to enhance the vertical height of the mandible. The long-term results were very satisfactory.

Montoro reported a 47-year-old male patient with an ameloblastoma in the posterior mandible who was treated with complete resection of a mandibular segment and reconstruction with iliac crest bone graft fixed with titanium plates and screws. This study showed good outcomes with recurrence risk reduction due to segmental resection, reliable mandibular reconstruction and less surgical procedures, allowing full rehabilitation within a shorter period of time and good esthetic and functional outcomes which improved quality of life.

In the current study no case of tumor recurrence occurred after a one year follow up, as sufficient bony tissue was resected before reconstruction and all cases were of ameloblastoma. Extensive resection with reconstruction allows less chances of recurrence. A review of the literature disclosed only 11 cases of recurrence of ameloblastoma in bone grafts. In the case presented the initial operation was a hemimandibulectomy followed by autogenous iliac bone graft. Sixteen years after the surgery there was clinical and radiographic signs of recurrence. It was concluded that extensive resection including bone as well as adjacent soft tissues is critical because the recurrences seem to stem from the soft tissues, especially from the adjacent periosteum.

Adabayo presents a case of soft issue recurrence in the chin 21 years after radical resection of the mandible for ameloblastoma. The iliac crest bone grafted to the site was not involved in the tumor recurrence. In study of Guerrissi, iliac bone graft was used for mandibular reconstruction and two years after surgery, good aesthetic and functional results were evident, and tumor recurrence was not observed.

CONCLUSION
It was concluded that reconstruction with iliac bone grafts alone or combined with rib graft is an excellent method of reconstruction in patients with mandibular defects.

REFERENCES