

## **Review Article: A review of advantages and disadvantages of different intraoral and extraoral autogenic osseous grafts in the reconstruction of bony defects**



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### **ABSTRACT**

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While performing a tooth extraction surgery, removal of implants with incorrect orientation, or sinus lift choosing the best source of graft is always facing a challenge. Various options are available for obtaining grafts to reconstruct the defects. To make the wise choice in each case we should follow these questions: Is autogenic grafts still the gold standard?

What are the benefits of intra-oral grafts in comparison with extra-oral ones?

Between all different available intra-oral sources, which one is of great advantage for the patient?

Is there a clear and certain protocol to select the donor site?

What are the new and innovative techniques carried out as case reports recently to highlight the less-paid attention sites?

To find the answers, a review of systematic reviews and case reports published in the PUBMED database from 2001 to 2017 was performed.

By reviewing articles introduced characteristics of different sources and surgical techniques, we can conclude there is a more or less specific protocol to guide the surgeons to select the best donor site in each case.

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## Introduction

The bone defects appear as a result of trauma, periodontal involvement, all-type resections of the maxilla or the mandible to limit the destruction of jaw tumors and pathology, tooth extraction surgery with substantial bone elimination unnecessarily, explantation of misplaced implant which can be facilitated by physiological and anatomical bone states.(1)

Reconstruction of these small to large-sized-defects in addition to horizontal and vertical bone augmentation techniques to get the best function and esthetic facial contour need donor sites with proper characteristics. The size and the type of defect, the status of the patient, and the expertness of the surgeon play an important role in the selection of materials.(2) The gold standard material shouldn't alert the immune-system while expediting osteoinduction and vascularization and surely provide sufficient amount.(2)

The allograft, autograft, xenograft, and alloplastic substances (synthetic) are the major groups of reconstruction material. As well as high success rate, autografts have all properties bolding them as one of the gold standard material although the post-operative malady can not be disregarded.(2-4 )

Autografts can be classified extra orally and intraorally respectively appropriate for large and small-medium lesions.(4)

### *Extraoral grafts:*

Widely, the surgeons prefer to avoid these grafts which cause excess morbidities such as skin scars(4) unlike severe defects of bone needed a considerable volume of bone.

1. The iliac crest is the most suitable region for the rehabilitation of large maxillofacial atrophies. The significant but uncontrollable resorption, wobbling after surgery, the need for hospitalization and general anesthesia leads the researcher to find a new source.

2. The cranial vault is a great strategic site because of low postoperative morbidity compared with others but exceeding the cranial cavity is a major risk expecting during surgery

also the graft obtained is somehow hard to form.

3. The fibula is a significant long site to repair a defect with special shape as it provides enough bulk of bone.

4. The tibia is quite uncommon to use clearly for its great complications.

5. Ribs( 4,5)

### *Intraoral grafts:*

These sites are more acceptable as it costs less, reduces procedure duration, is easier to perform, and is a two-step surgery due to proximity of recipient and donor sites rather than two distinct surgeries also the resorption is controllable and it has no scars, unlike extraoral operation.(4,6,7)

it is necessary to mention that tooth discomfort and infection of area are common as reported complaints.(7)

### *Maxillary donor sites contain:*

1. Maxillary tuberosity harvesting increases the chance of maxillary sinus exposure. Also, the quality of bone is not appropriate.

2. The zygomatic body has optimal accessibility however Schneiderian membrane and infra-temporal fossa puncturing, nerve damage, and optical concussion are susceptible. the bone achieved is not much too.

3. The zygomatic buttress has excellent availability and great shape but harvesting it has the same complaints as the zygomatic body.

4. The anterior wall of the maxillary sinus is a less paid attention area but of great advantages. The only complaint reported in studies is the risk of maxillary sinus perforation.

5. The incisive fossa is an uncommon site as teeth injuries are usual and the quality of bone is not acceptable greatly.

6. The anterior nasal spine is simply accessible just like the zygomatic body and provides a highly compact but low volume graft.

7. The palate is a site with high acceptance from patients but difficult accessibility, highly compact bone, teeth injuries, and

nasal perforation are its disadvantages.(1,2)

### ***Mandibular donor sites subtend:***

1. Mental graft harvesting can result in subcutaneous bleeding, modification of chin view, paresthesia of soft tissue and necrosis of anterior teeth. Some authors believed simple approachability make the site a famous choice (1,2 ) while others claimed that the technique sensitivity can lead to difficult complexities.(8)

2. Retromolar region and ramus of the mandible is hard to achieve and temporomandibular joint (TMJ) and inferior alveolar nerve injuries are predictable as well as fracture of borders of the mandible but there is no concern about esthetic consideration.(1,2,8)

3. Harvesting coronoid site causes TMJ damage and trismus and difficult accessibility is completely clear but the safety of teeth and should be said as its advantages.(1)

4. Torus is used as a compact bone graft by a simple surgery but having an adverse effect on lingual nerve and vascular.(1)

## **Conclusion**

To choose the optimal site to reconstruct a defect, approving the function and esthetic for the patient, and increase the quality of their life numerous factors should be considered such as the size of the defect, type of bone needed (medullary-cortical), the condition of the patient, and the connoisseur of the surgeon. By evaluation of all aspects, the surgeon should choose the best site with fewer complaints.

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