The use of iliac crest block onlay grafts and dental implants for the oral rehabilitation of severe trauma patients

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RESTORATIVE CHALLENGES OF SEVERE TRAUMA

Severe traumatic injuries can cause significant damage to teeth and associated soft and hard tissues (Fig. 1 and 2). Restored tooth that has been fractured, luxated, or avulsed and is reimplanted, compromising the long-term integrity (Fig. 3). Bone fractures requiring treatment with intramembranous screws, wires, and bone plates which can contribute bony nonunion and impaired plaque control (Fig. 4 and 5).

For the patient with a failed restoration can be extremely challenging. The primary role of the dentist is to provide comprehensive oral and medical care in which restorative and surgical treatment is planned to achieve optimal outcomes. The patient should be aware of the potential complications and the need for additional treatment to achieve a satisfactory result.

Providing the patient with a fixed restoration can be extremely challenging. The primary role of the dentist is to provide comprehensive oral and medical care in which restorative and surgical treatment is planned to achieve optimal outcomes. The patient should be aware of the potential complications and the need for additional treatment to achieve a satisfactory result.

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MARVELOUS BONE FROM ILIAC CREST & GRAFTING

Resistant chin is excised (Fig. 6) and size of defect measured in three planes (height, width, and thickness).

The iliac crest is then excised and the bone marked to represent the dimensions of bone required (Fig. 9). The bone is then contoured using an oscillating saw and appropriate burrs (Fig. 10 – 11). The bone is then contoured using an oscillating saw and appropriate burrs (Fig. 10 – 11). The bone is then contoured using an oscillating saw and appropriate burrs (Fig. 10 – 11). The bone is then contoured using an oscillating saw and appropriate burrs (Fig. 10 – 11).

Bone from the iliac crest is then measured and placed in a position that will be stable when fixed in place with a bone plate (Fig. 12).

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ASSESSING FOR BONE LOSS & GRAFTING

Fig. 13 shows a patient who has sustained an injury resulting in the loss of the lower anterior teeth following a fall (Fig. 12). The extent of the bone loss has been assessed by visual and digital methods (Fig. 12). In order to plan implants which would allow the final restoration to be placed in the ideal position, a bone scan was performed to assess bone quality.

Fig. 14 highlights the extent of the bone loss as assessed using an ex–in–vivo bone graft.

Pain implants in the patient without bone grafting may have been possible however this would have resulted in a compromised aesthetic outcome with loss of oral function.

This highlights the importance of orthodontic treatment to achieve implant placement.

CHOICE OF DONOR SITE FOR BONE GRAFT

Bone for grafting is often obtained from extra oral sites such as chin or ramus. However, multiple teeth are missing and the other side needs augmentation, in situ bone may not be adequate to provide sufficient amount of bone for solid function and soft tissue to be considered. In this situation, iliac crest bone was made available to the patient.

IMPLANT PLACEMENT INTO GRAFTED BONE

Bone graft must be left in place for a period of time to allow osseous union to occur (Fig. 15). During this period, the implant is left in place to promote the growth of bone tissue.

Fig. 16 shows the bone graft is placed in the ideal position in relation to the tooth site. The bone graft is then fixed with screws (Fig. 17).

Once the bone graft is placed in the ideal position, the implant is then fixed with screws to stabilize it (Fig. 18). The bone graft is then fixed with screws to stabilize it (Fig. 18).

In order to promote bone tissue regeneration and osseous union, the bone graft must be placed in the ideal position in relation to the tooth site. The bone graft is then fixed with screws to stabilize it (Fig. 18).

At regular intervals after an extraction, bone grafting can be a significant challenge as often the soft tissue barrier is inconsistent (Fig. 19).

Fig. 19 shows the graft site at two weeks. Notice the difference in bone position in relation to the tooth implant site (Fig. 15).

RECONSTRUCTION OF BONE AND SOFT TISSUE

Fig. 20 shows the graft site at two weeks. Notice the difference in bone position in relation to the tooth implant site (Fig. 15). The bone graft is then fixed with screws to stabilize it (Fig. 18).

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INTEGRATION OF IMPLANT INTO BONE

Implant integration is monitored using radiographs and periapical images (Fig. 21). The implant is monitored using radiographs and periapical images (Fig. 21).

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DISCUSSION

Retraction of patients who have had extensive trauma can be challenging. Clinical planning requires an understanding of the available bone and soft tissue. In order to achieve an aesthetic result, the soft tissue must be repositioned before finalization of the restoration. Often in many patients the bone loss and grafting of the alveolus may cause the repositioned soft tissue to appear unnatural and therefore necessitate a second surgical procedure to achieve a more natural result.

The grafting technique is essential in this context, the possibility of using a soft tissue grafting can result in a predictable outcome.

Timely implant placement within the grafted bone is essential along with soft tissue grafting to ensure a healthy peri-implant tissue can be maintained.

Successful management of these cases often requires a multi-disciplinary team approach to ensure optimal outcomes.