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Case Report

Rehabilitation of a gunshot wound with dental implants

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Introduction

Gunshot wounds are unpredictable puncture wounds that cause major tissue damage. Three factors work together to determine the severity of a gunshot wound, location of the injury, size of the projectile and speed of the projectile. Gunshot wounds, in the facial region cause severe hemorrhage. Patients are generally brought in with extensive damage to the hard and soft tissues. An efficient emergency care to save life, followed by a team approach to improve esthetics and function, will help in complete rehabilitation of the patient. Dental implants now have a major role to play in improving the esthetics as well as restoring function, contributing significantly toward rehabilitation of such patients.^{1,2}

Case report

A 26-year old male soldier of the Indian Army was shot with 2 bullets, on the face, by terrorists in the Kashmir valley [Fig. 1]. The patient was operated by a trauma team at a Military Hospital in Srinagar. Over a period of time, he underwent several surgeries in various hospitals by a team of reconstructive and maxillofacial surgeons. A forehead flap was rotated to reconstruct the nose and alveolar bone grafting was done in 11–14 region to complete the arch form. Six teeth were missing in the Maxilla, 11–15 and 24 [Fig. 2]. Root canal was previously done on teeth 21, 22 and two PFM crowns, joined together, were fitted on these teeth. The width of the grafted alveolus in 11, 12 region was 2 mm whereas it gradually increased to 6 mm in the region of 15. Since the width of

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Fig. 1 – Patient after sustaining injury.

the alveolus in the anterior maxilla was narrow, it was decided to place 3 dental implants in 13, 14 and 15 region and an implant-tooth supported restoration using 21, 22 and the three implants as abutments. Pontics on 11 and 12.

Commercially pure titanium dental implants were used for this case. A 4.0 mm diameter, 10 mm long implant was selected for 15 regions, since the maxillary sinus was in close proximity, whereas 3.8 mm diameter, 14 mm long implants were selected for both 13 and 14 region. The implants were placed under local anesthesia using NSK surgic AP physi-dispenser and a 1:20 reduction handpiece. Standard operating procedure was followed. Clinical and radiographic examination after 20 weeks confirmed osseointegration [Fig. 3]. Standard abutments were fitted which required slight modification of the facial surface [Fig. 4]. It was decided to replace missing 24 with a 3 unit PFM fixed partial denture, since bone width was insufficient in this region for an implant. A provisional restoration was fitted for a few weeks on the

Fig. 3 – OPG showing fitted restoration.

implants, followed by porcelain fused to metal fixed partial denture. Occlusal contact was given in centric, with no contact in eccentric movements [Fig. 5]. The patient was highly satisfied with the restoration, functionally and esthetically [Fig. 6]. He was educated and motivated toward the importance of maintaining good oral hygiene.

Discussion

There has been a significant increase in facial injuries, to military and paramilitary troops, in the north and north eastern states of India, in the last two decades, owing to an increase in insurgency. Surgical correction followed by prosthodontic rehabilitation restores esthetics and function of the patient and renders him fit to be prepared for war again.

A wide range of prosthetic treatment options are available for rehabilitation of partially edentulous patients. Depending upon the clinical need and demand, restoration of the missing teeth can be achieved by using a simple conventional removable partial denture, fixed partial denture, or dental

Fig. 2 – Grafted alveolus and missing teeth.

Fig. 4 – Abutments and teeth prepared.

Fig. 5 – PFM restoration fitted.

implant. Ideally each missing tooth should be replaced with an implant. In situations where this is not possible, a bridge can be given using implants on either side as abutments. There may be a situation arising at times where neither of the above two options are possible. In such cases natural teeth may have to be used as abutment on one side along with implants on the other. Such an arrangement is debatable and not acceptable to many a clinicians. However longitudinal studies have shown that the tooth-implant connection does not demonstrate any negative influences on the overall success rate. Therefore a prosthetic construction supported by both, tooth and an implant may be recommended as

a predictable and reliable treatment alternative.³ A clinician should also examine the alveolar process of the patient's maxilla in relation to the nasal cavity, the floor of the maxillary sinus and the incisive canal before placing the implants.⁴

Studies indicate an estimated survival of implants in combined tooth-implant-supported FPDs of 90.1% after 5 years and 82.1% after 10 years. The survival rate of FPDs was 94.1% after 5 years and 77.8% after 10 years of function. There was no significant difference in survival of tooth and implant abutments in combined tooth-implant FPDs.⁵

Several studies have been conducted with non-rigid connectors for implant-tooth supported restoration. Some researchers reported a three times greater bone loss in the case of a rigid tooth-implant connection as compared with freestanding partial prostheses or non-rigid tooth-implant connections.⁶

Conclusion

Success rates of both implants and reconstructions in combined tooth-implant-supported FPDs are lower than those reported for only implant-supported FPDs. Hence, only implant-supported FPDs should be planned for prosthetic rehabilitation. However, anatomical aspects, patient centered issues and risk assessments of the residual dentition may still justify combined tooth-implant-supported reconstructions. A review of literature shows that tooth-implant-supported FPDs have not been studied to a great extent and hence, there is a definitive need for more longitudinal studies examining these reconstructions.

Conflicts of interest

All authors have none to declare.

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Fig. 6 – Frontal view after treatment.