

Traumatic Palatal Defect Closure With Prosthesis Post Surgical Reconstruction: A Team Approach

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Background: Palatal defect may be a result of congenital malformations, trauma or tumors. In most maxillopalatal trauma, surgical reconstruction is required to restore the function and appearance. Any palatal defect caused by maxillopalatal loss that cannot be achieved with surgical reconstruction needs special and comprehensive treatment. This can be done by prosthodontist prosthesis rehabilitation.

Patients and Methods: A 20-year-old man underwent open reduction and internal fixation for severe maxillopalatal fracture and palatal loss. Intraoperative, the palatal defect could not be approximated due to palatal loss. In 3-month-follow up, there was a palatal defect and slight malocclusion due to anterior dental loss. Instead of performing complicated surgical procedures, we collaborate with the prosthodontist to assemble prosthesis with dental prosthesis that accommodate the closure of defect and improve appearance aesthetically.

Result: The use of prosthesis improves functional and psychological wellbeing. It does not only close the palatal defect, but it also fills the anterior dental loss thus overcoming the malocclusion. Satisfying functional and aesthetic outcome was achieved.

Summary: Rehabilitation of maxillopalatal defect has been well defined for prosthodontists and surgeons. A successful prosthetic design for functional restoration of the palatal defect utilizes the remaining palate and dentition to maximize the support, stability and appearance. In this case, prosthodontist and dentition prosthesis was used as modalities that offer simple solution to close the palatal defect compared to a more complicated surgical intervention.

Keywords: maxillopalatal fracture, palatal defect, prosthodontist prosthesis

Latar Belakang: Defek palatum dapat terjadi akibat kelainan kongenital, trauma atau tumor. Pada kebanyakan trauma maksilopalatal, tindakan operasi diperlukan untuk mengembalikan fungsi dan penampilan. Defek tulang palatum yang tidak dapat direkonstruksi dengan tindakan bedah memerlukan tatalaksana yang khusus dan komprehensif. Ini dapat dicapai dengan menggunakan prostese prostodonti.

Pasien dan Metode: Pasien laki-laki, 20 tahun, dengan fraktur maksilopalatal yang ekstensif dan kehilangan tulang palatum menjalani operasi reduksi terbuka dan fiksasi interna. Defek palatum tidak dapat diaproksimasi intraoperasi karena ada tulang palatum yang hilang. Pada saat kontrol 3 bulan ditemukan defek di palatum dan maloklusi ringan akibat kehilangan gigi depan. Dibanding melakukan prosedur operasi yang kompleks, kami berkolaborasi dengan prostodonti untuk membuat prostese palatum dan gigi yang mengakomodasi penutupan defek dan meningkatkan penampilan secara estetik.

Hasil: Penggunaan prostese memperbaiki fungsi dan psikologis pasien. Prostese tersebut tidak hanya menutup defek palatum, tapi juga mengisi gigi depan yang hilang sehingga mengatasi maloklusi. Terdapat perbaikan fungsi dan estetik yang memuaskan pada pasien ini.

Ringkasan: Rehabilitasi defek maksilopalatal telah diketahui dengan baik di kalangan prostodonti dan ahli bedah. Desain prostese palatum dibuat untuk restorasi fungsi dengan memanfaatkan palatum dan gigi geligi yang tersisa untuk memaksimalkan sokongan, stabilitas dan penampilan. Pada kasus ini, prostese merupakan sebuah modalitas yang menawarkan solusi sederhana untuk menutup defek palatum dibandingkan dengan intervensi pembedahan yang kompleks.

Kata Kunci: maxillopalatal fracture, palatal defect, prosthodontist prosthesis

Palatal defect may be a result of congenital malformations, trauma or surgical resection of the tumours. In most palatal

or maxillopalatal trauma, surgical reconstruction is required to restore the function and appearance. Palatal fractures are frequently associated with Le Fort maxillary fractures in

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midfacial trauma. They may present diagnostic and therapeutic challenges and result in malunion and occlusion problems if not treated properly.¹

Any palatal defect caused by palatal or maxillopalatal loss that cannot be achieved with surgical reconstruction needs special requirements. Comprehensive treatment after surgical reconstruction can be done by prosthodontist prosthesis rehabilitation. Multidisciplinary team of professionals is required to treat patients with palatal defect, so that long-term success in treatment can be achieved. Among them plastic surgeons, orthodontists, and prosthodontists are only part of the therapeutic team responsible for the medical care.²

The maxillofacial prosthodontist, as a member of the surgical team, is able to aid in the recovery and rehabilitation of the maxillectomy patient by fabricating and placing a surgical obturator. The immediate postoperative restoration of form and function shortens recovery time in the hospital and expedites the patient's return to the community as a functioning member.³

Many studies described about surgical reconstructions and put it at the highest level of treatment through complex and sophisticated techniques, but there is a simple way to maintain maxillopalatal defect. Each case may not only be treated by surgery, conservative rehabilitation also plays a role in the management of maxillopalatal defect. The aim of this paper is to offer a simple solution to close the palatal defect compared to a more complicated surgical intervention.

PATIENTS AND METHODS

A 20-year-old man had a motor vehicle accident and brought to emergency department. He had mild head injury with Glasgow Coma Scale 14 and midfacial fracture (Figure 1). He struck a traffic light pole right on the front face. On the examination confirmed with CT-scan (Figure 2), there was a severe maxillopalatal fracture with left zygomaticomaxillary complex fracture, palatal bone loss and anterior dental loss, resulting in malocclusion. There was no airway and breathing problems, no

massive haemorrhage and no left orbital function impaired.

We performed a surgical reconstruction, open reduction and internal fixation with miniplate & screw for severe maxillopalatal fracture and palatal loss. The fracture segments was retained into the anatomical position. Intraoperative, we had a problem to approximate the palatal defect due to anterior palatal loss. A single miniplate which expected to hold the gap between the palatal fracture, was placed transversally along the anterior of maxilla. The palatal mucosa from both side of fracture then dissected as a flap and approximated to close the gap. Post-operative, both anatomical and facial appearance was restored in good result. We predicted the anterior dental loss could be replaced by dental prosthesis after the surgical wound resolved. (Figure 3)

In 3-month-follow up, there was a palatal defect in the midline and slight malocclusion due to anterior dental loss. The palatal arch was impressed in the midline and filled with granulose tissue. The patient had problem with speech and there was a connection between oral and nasal cavities. It might be the granulation tissue covered the defect partially. Instead of performing complicated surgical procedures, we manage this case in collaboration with the prosthodontist to assemble prosthesis with dental prosthesis that accommodate the closure of defect and improves appearance aesthetically (Figure 3).

A perforated stock tray was selected for making the preliminary impression. The stock tray was modified using impression compound corresponding to the area of the defect. Primary impression of the maxillary arch was made using putty relined technique and the mandibular arch was recorded using alginate. The primary casts were obtained from the impression. These casts were surveyed and the necessary mouth preparation was performed on the patient before making secondary impression. Cast partial denture design of the prosthesis was finalized and the framework was fabricated. Then the framework was tried in the patient's mouth to check for the fit. At this stage the framework was used as a tray to



Figure 1. A 20-years-old man with severe maxillopalatal fracture with left zygomaticomaxillary complex fracture, palatal bone loss and anterior dental loss.



Figure 3. In 3-months-follow up, there was a palatal defect in the midline and slight malocclusion due to anterior dental loss. The palatal arch could not be restored due to anterior

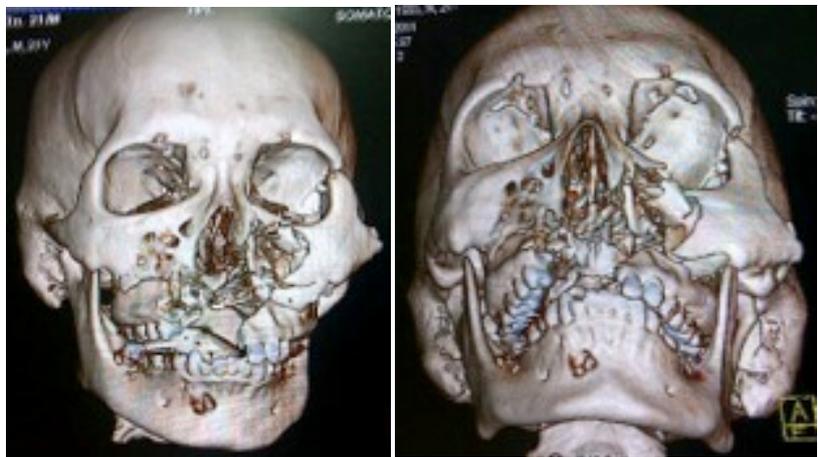


Figure 2. Facial 3-D CT showed a severe maxillopalatal fracture with left zygomaticomaxillary complex fracture, palatal bone loss and anterior dental loss.



Figure 4. Cast partial denture design of the prosthesis (acrylic) was finalized and the framework was fabricated. Then the framework was tried in the patient's mouth to check for the fit.

record the defect area using putty relin technique. A pick up impression of the remaining natural teeth were made using alginate. The impression was then poured following, which the framework was separated from the cast. At this stage a denture base was fabricated and the jaw relations were recorded. The missing teeth were arranged and try-in procedure was performed. The prosthesis with dental prosthesis was fitted, so that occlusion was corrected (Figure 4).

RESULT

The use of prosthodontist prosthesis with dental prosthesis in this case improves functional and appearance. It does not only close the palatal defect, but it also fills the anterior dental loss thus overcoming the malocclusion. This prosthodontist prosthesis aids speech and mastication. Any discomfort caused by the use of this prosthesis has not been reported, although the patient must check the patency of prosthesis regularly. Satisfying functional and aesthetic outcome was achieved.

DISCUSSION

Maxillopalatal defects may be a result of congenital malformations, trauma or surgical resection of tumours. The primary objective of rehabilitating these defects is to reconstruct and to improve the quality of life for these individuals. Among various maxillofacial defects, intra oral defects in the form of clefts and opening into the palate are very common. Several methods have been advocated for reconstructing these defects. The use of obturator prosthesis is one of them. Effective obturation of maxillopalatal defects produces sufficient separation of the oral and nasal cavity to improve the quality and intelligibility of speech. It also enhances masticatory function, deglutition and esthetics.⁴

In maxillopalatal fracture, open reduction and internal fixation has its primary modality prior to any procedure. Normal palatal arch and contours should be reproduced to facilitate post-operative speech and deglutition.⁵ In several cases, reconstruction surgery leaves palatal defect behind due to bone or mucosal loss of the palatal. There are many ways to close this palatal defect from simple to sophisticated.

We can use local flap, free tissue transfer, or conservative prosthodontist rehabilitation with their advantages and disadvantages.⁶ Rodriguez, et al advocate early reconstructive intervention using vascularized bone flaps to achieve superior functional and cosmetic outcomes in patient with palatal bone loss.^{2,6} Despite of dental loss, a simple flap palatoplasty also made an excellent closure of palatal defect as if in simple cleft palate.² There is also a more complex reconstruction surgery; Cordeiro and Santamaria reviews all maxillopalatal defects reconstructed immediately using pedicled and free flaps to establish a classification system and an algorithm for reconstruction of these complex problems. Free-tissue transfer provides the most effective and reliable form of immediate reconstruction for complex maxillectomy defects. The rectus abdominis and radial forearm flaps in combination with immediate bone grafting or as osteocutaneous flaps reliably provide the best aesthetic and functional results.⁷

Prosthetic rehabilitation is essential for maintaining postoperative oral function in patients with palatal loss not reconstructed with surgery. In such patients, maintaining sufficient oral function is difficult; especially if the patient is edentulous.⁸ The reconstruction of maxillopalatal defects with obturator prosthesis is one option to rehabilitate patients. In a short period of time, the patient can improve his abilities of deglutition and speech and therefore take part in a normal social life. Particularly, in older patients, patients with a high morbidity rate and patients with an unfavourable life expectancy, a quick and sufficient prosthetic rehabilitation is of great importance to preserve and restore a maximum quality of life. In contrast to reconstructive concepts based on microvascular free tissue transfer; a much shorter time period was required to complete the oral prosthetic rehabilitation. The long lasting, highly morbid procedures in oral rehabilitation based on free tissue transfer seem to demotivate the patients and they would for a complete prosthetic rehabilitation instead.⁹

The additional treatment modality, a continuous occlusal rest removable partial denture, not only restored missing teeth but also stabilized the remaining dentition in a

patient with advanced periodontal attachment loss. By engaging the guiding planes at the mesial surfaces of the abutments anteriorly and also the distal surfaces of the abutments posteriorly, the remaining teeth, with varying amounts of mobility, were splinted together by the framework. This conservative treatment option allows flexibility for easy repair during the life span of the prosthesis.¹⁰

SUMMARY

Rehabilitation of maxilla or palatal defect has been well defined for prosthodontists and surgeons. The prosthodontist prosthesis enables the patient to speak more effectively by reproducing normal palatal contours and by covering the defect. The obturator lessens the psychological impact of surgery by making the post-operative course easier to tolerate. The patient is reassured that rehabilitation has been implemented. The obturator may reduce the period of hospitalization. Artificial anterior teeth may be added for aesthetics, so that when the patient recovers from the operation, the teeth and facial appearance are psychologically comfortable. The mental well-being of the patient is boosted considerably.⁵ In this case, prosthodontist and dentition prosthesis used as modalities that offer simple solution to close the palatal defect compared to a more complicated surgical intervention.

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