Teflon prosthesis in orbital floor fracture

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PG Harris, R-P Delorme, R Charbonneau, H Ciaburro, G Frenette. Teflon prosthesis in orbital floor fracture. Can J Plast Surg 1994;2(1):32-34. Primary bone grafting is the recommended treatment for orbital floor fractures with bone defects, but this technique has a greater operative morbidity than the simpler use of the Teflon prosthesis. This study evaluates the use of the Teflon prosthesis. In 9 years, 110 patients with 115 orbital floor fractures were treated with Teflon prostheses. Of those, 90 patients had only orbital floor or orbito-zygomatic fractures and 20 had panfacial fractures. The mean operative time was 87 mins. Seventy-seven patients had good results. Complications included diplopia, ectropion, enophthalmia and palpable prosthesis. Seven prostheses required removal between three and 11 months postoperatively. No prosthesis became infected. Orbital floor reconstruction with a Teflon prosthesis is a relatively simple and short procedure associated with a low morbidity, giving good results except in cases of severe floor defects.

Key words: *Complications, Morbidity, Orbital floor, Reconstruction, Teflon prosthesis*

Prothèses de téflon pour fracture du plancher orbital

RÉSUMÉ : La greffe osseuse primaire est le traitement recommandé pour les fractures du plancher orbital accompagnées de défauts de l'os, mais cette technique s'accompagne d'une morbidité opératoire plus élevée que le simple emploi d'une prothèse de téflon. Cette étude évalue l'emploi des prothèses de téflon. En 9 ans, 110 patients atteints de 115 fractures du plancher orbital ont été traités à l'aide de prothèses de téflon. Parmi eux, 90 patients n'avaient que des fractures du plancher orbital ou des fractures orbito-zygomatiques et 20 présentaient des fractures pan-faciales. La durée moyenne des interventions était de 87 minutes; 77 patients ont présenté de bons résultats. Les complications ont été, entre autres, la diplopie, l'ectropion, l'énophtalmie et une prothèse palpable. Ces prothèses ont dû être retirées dans les 3 à 11 mois suivant l'opération. Aucune prothèse ne s'est infectée. La reconstruction du plancher orbital à l'aide d'une prothèse de téflon est une intervention relativement simple et brève qui s'associe à un taux faible de morbidité qui donne de bons résultats, à l'exception des cas de défauts graves du plancher.

The thinness of the bones of the orbital floor and the presence of the infra-orbital canal make the floor very fragile and prone to fracture in facial trauma.

Many different treatments have been recommended from simply packing the maxillary antrum to complete anatomical reconstruction of the bony orbit with rigid fixation and immediate bone grafting which seems to be the latest optimal treatment (1-6). Three sites of autogenous bone graft are commonly used for orbital reconstruction: cranium, iliac crest and split rib (7). Each has advantages and disadvantages. They are supposed to be more resistant to infection but offer significant donor site morbidity (epidural tears, ileus, pain and pneumothorax), are prone to resorption and require long operative time (8,9).

Advantages of synthetic materials for orbital reconstruction include their easy availability, their resistant and non-absorbable character and their thinness and plasticity. Their main disadvantages are a high incidence of postoperative

Teflon prosthesis infection of up to 7.4% and associated extrusion (10,11).

MATERIAL AND METHODS

In order to evaluate the results of treatment of orbital floor fractures with Teflon prostheses, a retrospective chart review of all the orbital floor fractures at Hôpital Notre-Dame in Montreal for the period 1983 to 1992 was conducted.

Study population

Of 180 patients presenting with orbital floor fractures, 70 had no defect of the floor and did not require reconstruction. All those with floor defects (110 – 84 males and 26 females) required orbital floor reconstruction with a Teflon prosthesis. Ages ranged from 13 to 79 years with a mean age of 35 years. Ninety patients had only orbital floor or orbito-zygomatic fractures, 20 had panfacial fractures. Five patients had bilateral orbital fractures for a total of 115 orbital reconstructions (60 right, 55 left).

Operative technique

Under general anesthesia and local infiltration with a solution of xylocaine and adrenaline, through a subciliary or

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Figure 1) Teflon prosthesis in position behind the infraorbital rim

sub-tarsal incision, the orbital floor was explored. In the patients with floor defects, an appropriate size and shape (small, medium, large, right and left) prosthesis was chosen and tailored to the floor. The prosthesis was placed behind the infraorbital rim (Figure 1). The closure was achieved in layers, periosteum, muscle and skin.

RESULTS

Four operating surgeons were responsible for the 110 patients (Figure 2). Similar surgical indications and techniques were used. Antibiotic prophylaxis was used in 72% of the cases. The delay between trauma and surgery ranged from same day to 57 days post-trauma, with a mean of 9.5 days and a mode at day five. The mean operative time was 87 mins with a standard deviation of 37 mins including the patients with orbito-zygomatic fractures.

Most patients required a short postoperative hospital stay of one to three days. Four patients were discharged on the same day while 13 polytrauma patients stayed from eight to 482 days (Figure 3).

Of the 110 patients, 77 (70%) had good results with no diplopia, enophthalmia or complications following surgery. Nine patients were lost to follow-up. Five patients had persistent enophthalmia. Two of them with severe defects of the floor required removal of the prosthesis and bone grafting at six and 11 months postoperatively. Nine patients suffered from persistent diplopia. One required prosthesis removal at six months postoperatively with subsequent improvement of the diplopia. Seven ectropions requiring treatment were found, one of which required removal of the Teflon prosthesis at three months postoperatively while the other improved with conservative management. One patient suffered a recurrent orbital trauma that required enucleation two months after the first repair. Finally two prostheses were palpable and required removal both at nine months postoperatively. In this series, there

Figure 2) Cases per operating surgeon (n=4)

Figure 3) Postoperative hospital stay (in days)

were no Teflon prosthesis infections, while other series quote a rate of 7.4%. Of note, two patients developed infection of the metallic plates and screws for osteosynthesis and required their removal.

DISCUSSION

Primary bone grafting is an accepted treatment but entails morbidity of the donor site and longer operative time. The unpredictability of graft resorption is troublesome. Long term results of autogenous orbital floor reconstruction have to be evaluated.

Teflon prosthesis reconstruction is an adequate treatment. It gives good results in most patients. Contrary to other studies (10,11) infection of Teflon prostheses has not been encountered here. There is no donor site morbidity and the operation is relatively short and simple making it accessible to most surgeons. Nevertheless, 6% of Teflon prostheses required removal for various reasons usually associated with more severe defects of the orbital floor and accompanying fractures. No correlation was found between antibiotic prophylaxis and prosthesis removal.

Larger defects of the orbital floor with severe comminu-

tion would probably do better with primary bone grafting for reconstruction of the floor, but when dealing with moderate defects, Teflon prostheses do provide an adequate solution.

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CONCLUSION

Orbital floor reconstruction with a Teflon prosthesis is a short and simple procedure associated with a low morbidity and offer good results in partial floor defects.