Severe distortion of orbital titanium mesh following facial trauma recurrence: a potential threat for orbital contents?

Jean-Marc Foletti¹,², Paolo Scolozzi²

¹ Aix Marseille Univ, APHM, IFSTTAR, LBA, Hôpital Nord, service de Chirurgie Maxillo-Faciale, Marseille, FRANCE
² Hôpitaux Universitaires de Genève, Service de chirurgie maxillo-faciale / UNIGE, Faculté de médecine, Genève, SUISSE

**Introduction**
Among the materials used to reconstruct fractures of the orbital walls, titanium mesh implants (TMIs) have proved their effectiveness for restoration of pre-traumatic orbital anatomy. The compromise between stiffness and elasticity of the TMI provides good support of the orbital content. Its optional attachment to the orbital bony rim using screws also strongly limits the risk of secondary displacement of the implant and promotes the durability of the reconstruction.

This relative stiffness may also potentially become a disadvantage in trauma recurrence severe enough to cause sharp TMI deformation. In these particular cases, the TMI can behave like a penetrating foreign body threatening the critical adjacent anatomical structures, especially with regards to the eye globe. We are reporting the case of a facial trauma recurrence in a patient whose orbit was previously reconstructed by a TMI, which resulted in a severe deformation.

**Case report**
A 40-year-old patient was admitted for maxillofacial trauma in January 2017; the patient reported being assaulted. Clinical and radiological examinations showed combined Le Fort I, II and III-type fractures. The head CT scan revealed a severe distortion of a previously placed TMI in the left orbit (Figure 1; arrow).

In November 2015, the patient had a left combined orbital floor and medial wall fracture. The ophthalmological examination revealed a diplopia in down gaze and in adduction, a retinal hemorrhage with a decrease of visual acuity (20/100) on the left eye. A TMI (Depuy-Synthes®, Switzerland) had been placed and held by two screws at the lower orbital rim. Positioning of the implant was controlled by intraoperative navigation.

The post-operative CBCT confirmed optimal positioning of the TMI (Figure 2). The postoperative examination revealed no diplopia and an improvement of his visual acuity on the left eye (20/50).

After the trauma recurrence, the TMI was severely deformed towards the inside of the orbit, in contact with the inferior rectus muscle (Figure 3). The TMI was removed through a preseptal transconjunctival and transcaruncular approach. No concomitant reconstruction was performed. Conjunctiva was closed with a 6/0 absorbable suture (Maxon, Covidien®, USA). The postoperative ophthalmological status was unchanged with regards to the visual acuity of the left eye (20/50).

**Discussion**
Used for 25 years, TMIs represent a valid option for reconstruction of orbital wall fractures. A TMI, like any foreign body, has its own potential morbidity. Our case has demonstrated that in the event of traumatic recurrence, a properly positioned TMI may deform, thus transforming into a potentially threatening penetrating object for the surrounding structures.

If this case does not call into question the use of TMIs in orbital reconstruction, from now on, we consider that this potential complication should be disclosed in the information delivered to the patients. In contrast, we do not envisage the systematic removal of the TMIs. The complications induced by a new incision of the eyelid would then be feared: eyelid margin malpositions being theoretically more frequent on the multi-operated patients.