

## A Case of Bacterial Meningitis and Pneumo-orbit, on a Background of Previous Orbital Fracture Repair with Titanium Plate

**Anna Gkountelia\*, R Scawn, W Grant and Wessam Mina**

Chelsea and Westminster, Craniofacial and ENT Department, London, United Kingdom

**\*Corresponding Author:** Anna Gkountelia, Chelsea and Westminster, Craniofacial and ENT Department, London, United Kingdom.

**Received:** May 16, 2022

**Published:** July 13, 2022

© All rights are reserved by **Anna Gkountelia, et al.**

### Abstract

Blunt trauma to the orbital rim is a frequent cause of both orbital fractures and damage to the surrounding facial bones and soft tissues. Many surgical specialties, including ophthalmologists, otolaryngologists, maxillofacial specialists, neurosurgeons, and plastic surgeons, evaluate and treat orbital fractures. Restoration of orbital volume after internal orbital fractures can prevent enophthalmos. A variety of high strength materials/allografts are commonly used that boast low postoperative complication rates, including titanium mesh with and without porous polyethylene coating. Some controversy exists over the use of uncoated titanium mesh in the orbit. Newer products contoured to the three dimensional orbital anatomy aim to improve reestablishment of the complex orbital shape [1-4]. There is no previous bibliography available to support a plate is a source of meningitis. We report a case of bacterial meningitis and pneumo-orbit, on a background of previous orbital fracture repair with titanium plate, and our management technique.

**Keywords:** Blunt Trauma; Orbital Fracture; Ophthalmology

### Case Report

A 36-year-old man normally fit and well, sustained a left orbital floor medial wall fracture following trauma in 2006 playing rugby, which was managed and operated with titanium plate. Ten years after surgery (July 2016), the patient developed meningitis organism questionable, which has been managed with IV Ceftriaxone for 2 weeks. Treatment has been extended to 6 weeks as per titanium plate infection suspect.

Two years later (May 2018), the patient presented with symptoms of pneumo-orbit. For the past few months, he reports bulging of the left eye associated with sneezing or blowing his nose, with proptosis and blurred vision lasting a few seconds. The ophthalmology examination was unremarkable. No obvious swelling, rash or skin discolouration around eye or face, no bulging of the eye, normal eye motility, good VA, no diplopia, normal colour vision, healthy optic discs bilaterally.

### CT orbits

Reviewed old metal plate fixation of left orbital fracture without any obvious complication associated with it, old fracture of left lamina papyracea with mild herniation of orbital fat, evidence of bilateral maxillary sinusitis, no evidence of acute intracranial pathology, no evidence of orbital infection or any soft tissue abscess.

Impression of acute bilateral sinusitis and therefore concern regarding infection of the left orbital floor prosthesis has been raised. Close observation and optimisation of his sinus has been suggested with saline douching and short course of decongestant as there is a sign of polyps in the left maxillary sinus and thickening of the mucosa.

One month later reviewed in ophthalmology department, normal examination, no proptosis or enophthalmos.

CT orbits with dynamic nose blowing sequence: Air-orbit on CT with deliberate nose blowing prior. The possibility of some extrusion of the orbital implant at the junction of the floor medial wall has been raised. There are no clinical or radiological signs that the plate is infected and there is some bony healing around the plate.

No previous bibliography to support a plate is a source of meningitis. With regard to the air in the orbits, the type of plate that is used is a fenestrated plate and there is possibly a gap either in the floor of the orbit or in the ethmoid area.

Removing the plate would be complex associated with a high risk of diplopia, injury to muscle, globe, sinus; although endoscopic evaluation and possible trimming of the medial aspect of the plate could be undertaken to try and correct the episodes of air within the orbit and the experiences of nose blowing.

Surgery under endoscopic exploration: Incidental finding a large maxillary antral cyst (Figure 1), which was removed allowing inspection of the roof of the maxillary antrum and floor of orbit which appeared intact and unremarkable otherwise. The protruding titanium/Medpor prominence (Figure 2) was identified and has been bended medially to achieve a curvature in line with the medial orbital contour and removing its projection into the ethmoid cavity. This was then overtaken with a middle turbinate flap having preserved the superomedial aspect of the middle turbinate and having fixed this to the septum with a transeptal suture to maintain ventilation of the frontal sinus.

**Figure 1:** Large maxillary antral cyst.

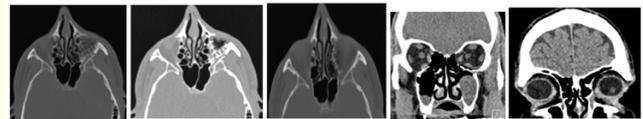
**Figure 2:** Protruding titanium/Medpor plate prominence.

### Two weeks post operatively

A satisfactory reconstruction was achieved, and splints were removed. The patient has avoided blowing during the healing phase. No adverse sequelae from the operation. Ophthalmology examination unremarkable. Advised to contact the department as the need arises.

**Figure 3**

Bone flakes have been used to cover the plate.



**Figure 4**

CT orbits: Left orbit plate, herniation of orbital fat, thin linear layer of gas lays superior to the plate. Communication between orbit and ethmoidal cells.

### Conclusion

In the patient described here in, bacterial meningitis and pneumo-orbit has been developed, on a background of previous orbital fracture repair with titanium plate. Clinical symptoms necessitated endoscopic evaluation and possible trimming of the medial aspect of the plate to try and correct the episodes of air within the orbit and the experiences of nose blowing. Although it is possible that the plate alone contributed to the pneumo-orbit phenomenon, it is unlikely that the meningitis episode was indeed related to the defect in the medial wall of his orbit.

Allografts implants are reasonable choices for orbital fracture repair [10-13]. Despite proper materials selection and placement, postoperative complications still occur. Episodes such as pneumo-orbit, meningitis and proptosis, in general, require extensive investigation and evaluation, especially on a background of previous orbital fracture surgery [5-9].

Thanks very much for the assistance and cooperation provided to the Chelsea and Westminster Hospital Craniofacial and ENT Department.

13. Brucoli M., et al. "Analysis of complications after surgical repair of orbital fractures". *Journal of Craniofacial Surgery* 22 (2011): 1387-1390.

## Bibliography

1. Lelli G., et al. "Orbital floor fractures: evaluation, indications, approach and pearls from an ophthalmologist's perspective". *Facial Plastic Surgery* 23.3 (2007): 190-199.
2. Sicher H and DeBrul EL. "Oral Anatomy". 5<sup>th</sup> ed. St. Louis: Mosby (1970): 78.
3. Manson PN., et al. "Toward CT-based facial fracture treatment". *Plastic and Reconstructive Surgery* 85.2 (1990): 202-212. discussion 213-214.
4. Zingg M., et al. "Classification and treatment of zygomatic fractures: a review of 1,025 cases". *Journal of Oral and Maxillofacial Surgery* 50.8 (1992): 778-790.
5. Cook T. "Ocular and periocular injuries from orbital fractures". *Journal of the American College of Surgeons* 195.6 (2002): 831-834.
6. Sires BS., et al. "Oculocardiac reflex caused by orbital floor trapdoor fracture: an indication for urgent repair". *Archives of Ophthalmology* 116 (1998): 955-956.
7. Ng P., et al. "Imaging of orbital floor fractures". *Australas Radiology* 40.3 (1996): 264-268.
8. American Academy of Ophthalmology. "Basic and Clinical Science Course". San Francisco: American Academy of Ophthalmology; 2008. Section 7: Orbit, eyelids, and lacrimal system (2008): 101-106.
9. Cheong EC., et al. "Endoscopic management of orbital floor fractures". *Facial Plastic Surgery* 25.1 (2009): 8-16.
10. Pham AM and Strong EB. "Endoscopic management of facial fractures". *Current Opinion in Otolaryngology and Head and Neck Surgery* 14.4 (2004): 234-241.
11. Smith B., et al. "Duane's Clinical Ophthalmology". Philadelphia, PA: Lippincott-Raven. Fractures of the orbit (1994).
12. Cole P., et al. "Principles of facial trauma: orbital fracture management". *Journal of Craniofacial Surgery* 20.1 (2009): 101-104.