Pott's Puffy tumor: New technique in Calvarial reconstruction

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Introduction

Pott's puffy tumour is chronic osteomyelitis of the frontal bone with subperiosteal abscess. It is a rare complication of sinusitis first described in the 18th Century by Percival Pott. Treatment involves long course of antibiotics, open approaches and more recently endoscopic endonasal drainage of the frontal sinus.

The management is challenging when chronic osteomyelitis involves the inner table and extensive sections of the outer table. In this situation, the bony defect following debridement will need reconstruction to protect the underlying brain and prevent cosmetic step deformity or frontal bossing. The bony defect can be left alone or undergo delayed closure with autologous bone grafts or alloplastic materials. Cranioplasty is typically delayed in infected wounds to minimise the risk of infection and graft removal.

Aim

First published technique for the use of modified distraction osteogenesis in primary reconstruction of the anterior cranial vault

CT Sinus: erosion of inner and outer table

Case Report

- 55 y ♂ Frontal headache, nasal obstruction, intermittent frontal swelling. Normal flexible nasoendoscopy, no frontal swelling on examination. Rx medically with topical steroid drops and doxycycline
- CT, MRI (with DWI and contrast): extensive osteomyelitis of frontal bone (inner and outer table) with subgaleal collection, enhancement underlying dura. Lab: slight leukocytosis and neutrophilia, -ve screen for HIV, TB
- Pt declined endoscopic surgical debridement, Rx 1 month of co-amoxiclav (poor tolerance), changed to clarithromycin
- Clinic: right frontotemporal swelling aspirate 15 ml pus temporal region grows Streptococcus Milleri
- MDT: Pre-operative antibiotics, debridement & reconstruction (delayed graft vs **primary** traction osteogenesis)
- Preop: IV benzylpenicillin 2.4g/4 hourly, oral metronidazole for 2 weeks then 4 weeks oral amoxicillin 1g TDS and 6 weeks metronidazole 400mg TDS
- Surgery: Bicoronal flap + craniectomy (leaving defect 90x44 mm over frontal vault)
- Reconstruction: Creations of transport disc 10 mm on each side (attached to underlying dura), external frame, plates attached to transport disc, distraction wire for movement "Distraction-Traction osteogenesis"
- Postop: Ceftriaxone 4g daily for 2 weeks then 2 g daily for another 2 weeks through PICC

- Device activation started 1 week after operation
- Turning device 0.6 mm daily in the first 10 weeks
- 3 Serial Dental cone beam computed tomography (CBCT) 2 weeks apart (1st month) then x-ray facial bones (weekly 2nd month then every 2-3 weeks)
- External frame, wires removed after 3 months

4 weeks

8 weeks

12 weeks

Reference:

1. Akiyama K., Karaki, M., Mori N. Evaluation of Adult Pott's Puffy Tumor: Our Five Cases and 27 Literature Cases. Laryngoscope 2012; 122:2382-2388
2. Ong J et al. Posterior Cranial Vault Distraction Osteogenesis: Evolution of Technique. Semin Plast Surg. 2014 Nov; 28(4): 163-178.

Result

Bone healing is complete (7 months post surgery), successful
Complication: mild cellulitis at skin penetration by the frame after removal treated by short course of oral co-amoxiclav