Spontaneous closure of traumatic CSF otorrhoea following conservative management

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SUMMARY

We present a 40 year-old male who sustained a head injury with left cerebrospinal fluid otorrhoea following a road traffic accident. Plain radiograph revealed a defect in the temporal bone extending in to the tympanomastoid area. Patient was managed conservatively with closure of the fistula and resolution of the leakage within 8 days after injury. We report this to further buttress the role of conservative management in CSF fistula.

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Introduction

The commonest cause of CSF fistulae is trauma to the skull base. Head trauma accounts for 50-80% of all cases of CSF leak, and up to 16% are iatrogenic. CSF otorrhoea complicates 6% - 30% of basilar skull fractures [1, 2]. The management is dependent on history, confirmation of CSF and identification of bony defect. The treatment may be conservative or surgical, the goal is repair of meningeal tears and underlying bone defects [1-4]. Spontaneous healing of CSF otorrhoea has been reported in 90% of cases following conservative management [1-4]. We hereby report a case of spontaneous closure following conservative management of traumatic CSF otorrhoea in a young African male.

Case summary

A 40 years old male, right handed Nigerian battery charger presented to the Accident and Emergency department of our hospital with a 6 day history of watery left otorrhoea and hearing impairment following a road traffic accident. He was riding a motor bicycle when a fast moving vehicle knocked him down; this was followed by a bloody left otorrhoea and loss of consciousness. He regained consciousness within 24 hours although bloody otorrhoea continued, which later turned to clear, colourless fluid. There was no evidence of bleeding from other craniofacial orifices. He was referred to our centre after 5 days of injury.

Examination revealed a conscious and well-oriented adult with a Glasgow Coma Scale score of 15/15. The left ear showed clear colourless fluid, filling the left concha. The tuning fork showed a left conductive hearing loss. The facial nerves were intact; and the right ear; nose and throat were normal. There were healing abrasions and lacerations on the face and a sutured left fronto-parietal injury. Plain radiograph of the temporal bone reveals fracture line extending through the lteral waal of the petrous bone extending through the tegmen tympani into the middle ear.

Patient was started on antibiotic and tetanus prophylaxis; and a clean piece of gauze was left in the concha area of the left pinna to soak the effluent. He was nursed head – up position and advised to stop or minimize action that can increase intravenous pressure such as coughing, sneezing or bearing down. Gradual reduction in the volume of the effluent was observed on day 1 and 2, until day 3 (8 days post trauma) when the concha was largely dry with only a drop found around the opening of the external auditory canal.

Discussion

Traumatic CSF fistulae have been described since the middle ages. Willis was reported to be the first to record instance of CSF fistula in 1676 [3] and Walter Dandy was credited with the first successful repair of traumatic dural laceration secondary to basilar skull fracture [4]. Leakage through an enlarged labyrinthine facial nerve canal and enlarged geniculate fossa has been reported [5]. Other sites include fractures of the petrous temporal bone, developmental defects of the tegmen tympani or petrous apex with meningocele formation and

spontaneous or posttraumatic meningeal laceration, translabyrinthine fistula due to the Mondini developmental defect of the cochlear modiolus and/or lamina cribrosa, wide cochlear aqueduct syndrome and perilymphatic fistula from trauma with stapes fracture and torn round or oval window membrane [6-8]. Diagnosis of CSF otorrhoea is dependent on good history, physical examination and radiologic investigations.

In the background of head injury, a clear colourless fluid in the ear is suggestive of CSF otorrhoea. However, simple demonstration of glucose in the fluid using glucostix and absence of stickening of the handkerchief may strengthen the diagnosis of CSF [5, 6-9]. Radiology plays an important role in confirming the site, size and aetiology of the leakage. CT Scan demonstrates the fracture site that overlies the traumatic leak and provides information about the adjacent brain parenchyma. Intrathecal Fluorescein is the most accurate method of localizing site of leak, however it is associated with complications like transverse myelitis and allergic reactions [10]. Nuclear studies using radioisotopes e.g. iodine I^{131}, radio iodinated serum albumin (RISA), Ytterbium YB^{169} diethylenetriamine penta acetic acid (DTPA), indium In 111 DTPA, technetium Tc 99m human serum albumin, and technetium Tc^{99} pertechnetate has been documented. Despite relative safety, they have limitations with false positive results of up to 33% [5–9]. Digital subtraction cisternography is useful when the conventional methods fail to identify the site of leak. Diagnostic yield may be improved by injection of metrizamide or omnipague [7-10]. A brisk CSF leakage may be demonstrated by MRI, it is however, not typically recommended for evaluation due to poor bone defect demonstration. The management could be conservative or surgical. Fifty to eighty-five percent of traumatic CSF leaks resolve spontaneously within 7 days, and almost all leaks cease within 6 months of conservative management [6-11].

It consists of measures to reduce CSF pressure to allow for approximation of dural tear and induction of healing by primary intention. This includes bed rest with patient in head - up position and avoidance of coughing, sneezing and heavy lifting. Therapeutic reduction of the spinal fluid production using agents such as acetazolamide and frusemide and repeated removal of CSF via lumbar tap or an indwelling catheter has also been tried with minimal success [10-12]. Laxatives have been used to decrease raised intracranial pressure associated with bowel movement [7]. Spontaneous closure observed with CSF otorrhoea has been explained to be due to the rich arachnoid mesh in the middle and posterior fossa area. However the period of waiting is arbitrary and this often requires close cooperation between neurosurgeons, neuroradiologist and otolaryngologist. A waiting period between 5 days and 8 weeks has been reported [7-12]. Posttraumatic CSF fistulas persisting beyond 7 days, spontaneous CSF leaks with skull-base defects, increasing pneumocephalus, and meningitis are positive indications for surgical intervention. Extracranial and endoscopic repair by the otolaryngologist has been reported, however, open craniotomy with intradural repair is necessary for large skull-base defects [10-13]. Prophylactic antibiotics used in this patient seem to be the widely accepted practice. This is to prevent the occurrence of infection, particularly meningitis. Meningitis has been reported in 25-50% of untreated traumatic CSF fistulas and in 10% of patients in the first week after trauma with head injury [10-12]. However, we were able to prevent this in the patient and hence successfully discharged for follow – up in the outpatient clinic.

Conclusion

This case has further reinforced the success of conservative management of CSF fistula, particularly otorrhoea, however, meticulous care is needed with proper application of guidelines in the management of skullbase defect.

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