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CASE REPORT

Mastoiditis causing Sinus Thrombosis and Posterior Fossa Epidural Haematoma

Case report

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التِهابُ الخُشَّاء يتسبب في خُثار جَيبي وورم دموي فوق جافية الحفرة الخلفيَة

تقرير حالة

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الملخص: نادرا ما يحدث ورم دموي فوق الجافية بشكل تلقائي، أما الورم الدموي التلقائي فوق جافية الحفرة الخلفية بسبب تخثر الجيب السيني الناتجة عن التهاب الخشاء لم يتم الإبلاغ عنه في الأدبيات الطبية الإنجليزية. ندرج هنا تقريراً لحالة رجل عمره 40 عاما والذي جاء يشكو من الصداع وعدم التناسق الحركي. أكد التصوير بالرنين المغناطيسي وجود نزيف تحت الحاد فوق الجافية في الجهة اليمنى من الحفرة الخلفية مع التهاب الخشاء، وخثار الجيب السيني الأيمن. تم إجراء حَجَّ القِحْف تحت القذال وإخلاء الورم الدموي وبذا تماثل المريض للشفاء وانتهت شكواه.

مفتاح الكلمات: ورم دموي، فوق الجافية، القحف الحفرة الخلفية، خثار الجيب، التهاب الخشاء، تقرير حالة، الهند.

ABSTRACT: Spontaneously occurring epidural haematomas are an uncommon entity. A spontaneous post fossa epidural haematoma due to sigmoid sinus thrombosis secondary to mastoiditis has not been reported in English medical literature. We report a 40 year-old man who presented to us with headache and incoordination. A magnetic resonance imaging (MRI) confirmed epidural sub-acute bleeding in the right side of posterior fossa with mastoiditis and right sigmoid sinus thrombosis. A right suboccipital craniotomy and evacuation of the haematoma was done and the patient was relieved of his complains.

Keywords: Haematoma, epidural; Cranial fossa posterior; Sinus thrombosis; Mastoiditis; Case report; India

Spontaneously occurring epidural haematomas (SEDH) are an uncommon entity. The possible causes are neoplastic lesions, craniofacial infections, bleeding disorders, uraemia, sinus thrombosis, heart surgery, arterio-venous malformation and intra-diploic epidermoid cysts. The case reported by Ahmad *et al.* is the only case of spontaneous posterior fossa epidural haematoma which occurred in a child with a cardiopulmonary bypass.[1] We report the first case of spontaneous posterior fossa epidural haematoma in a patient of sigmoid sinus thrombosis secondary to mastoiditis.

Case Report

A 40 year-old man was referred to the outpatients department of C.S.M. Medical University Hospital, India, with complaints of mild headache and incoordination. He had a 10-year history of recurrent right ear discharge which had been treated by oral antibiotics, but had no ear discharge at the time of presentation. He had no history of bleeding diathesis or trauma and was not a known case of any medical ailment. On examination, he was conscious, oriented and higher mental functions were normal. All his cranial nerves were intact with no signs of meningitis. He had an impaired tandem gait with no positive cerebellar signs. His haematological parameters, including renal function test, liver

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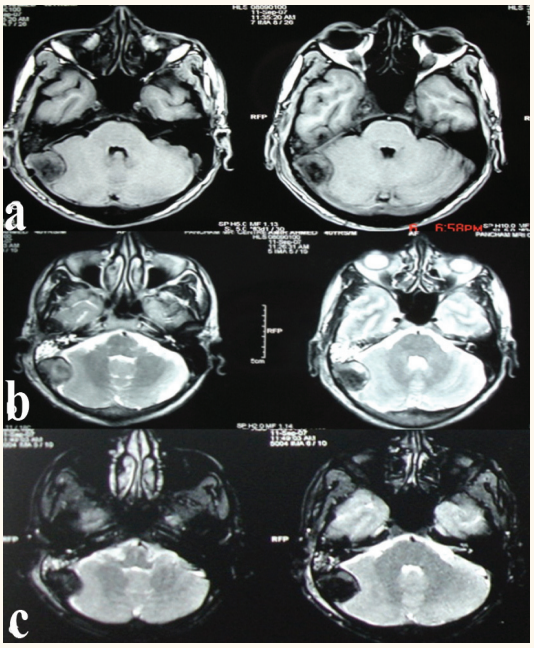

Figure 1: A: Axial T1-weighted magnetic resonance image showing hypointense signal with peripheral hyperintensity and right mastoid showing hypointense signal; **B:** Axial T2-weighted image showing hypointense signal with peripheral hyperintensity and right mastoid showing hyperintense signal; **C:** Gradient-echo sequence showing hypointense signal.

function test and coagulation profile, were normal.

The magnetic resonance imaging (MRI) scan of his brain with a venogram was already available and showed a well defined extra axial lesion on right side of the posterior cranial fossa postero-medially to the right mastoid with hypointense signal on T1W, T2W and GRE images [Figure 1] and peripherally hyperintense on T1W and T2W image suggestive of early subacute epidural bleeding. The right mastoid showed T1 hypointense and T2 hyperintense lesion suggestive of mastoiditis. A magnetic resonance (MR) venogram imaging scan demonstrated a right sigmoid sinus thrombosis [Figure 2]. As both the MRI and the venogram demonstrated a haematoma with thrombosed right sigmoid sinus, no other investigation was done and surgery was planned.

A retromastoid suboccipital craniotomy was done and an epidural organised clot of 30 ml volume evacuated. A craniotomy was preferred over craniectomy as peroperatively no evidence of infection was found and the craniotomy prevents a bone defect. The free bone flap was washed with chloramphenicol saline and kept in chloramphenicol

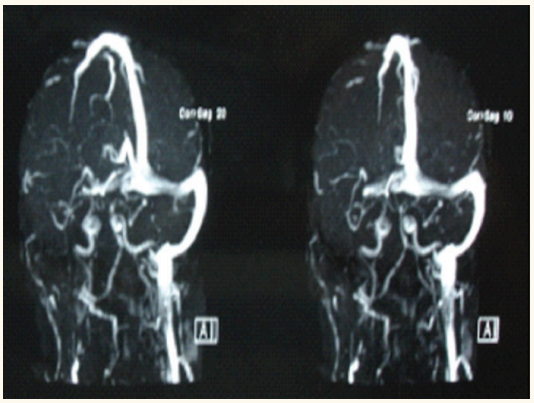

Figure 2: Magnetic resonance venography demonstrating thrombosis in the right sigmoid sinus.

saline during the surgery.

Mild oozing was noted from the transverse sinus region which was managed by packing with absorbable haemostat (Surgicel®, Ethicon, Inc., Summerville, NJ, USA). The patient was complaint free in the postoperative period and was subsequently transferred to the Ear Nose and Throat Department for the management of right mastoiditis and then modified radical mastoidectomy after 4 weeks. The haematoma was confirmed on histopathology and the culture was found to be sterile.

Discussion

Spontaneously occurring cranial epidural haematomas have been reported in the literature worldwide. Liedbeck *et al.* in 1848 reported the first case of SEDH in a patient with haemophilia.[2] Schnieder *et al.,* in 1951, were the first to report a case of SEDH in a case of craniofacial infection in autopsy of two patients.[3] To date there have been 55 reported cases of SEDH [Table 1].

There are seven possible causes for SEDHs mentioned in the world literature. The commonest possible cause for spontaneous epidural haematoma reported in the international literature is neoplastic condition.[4-11] The most common type of SEDH is hepatocellular carcinoma reported in seven cases. The other neoplastic conditions mentioned are eosinophilic granuloma,[5] Langerhans' cell histiocytosis,[6] lung carcinoma,[7] ovarian carcinoma,[8] malignant fibrous histiocytoma,[9] and Ewing's sarcoma.[10]

The second commonest possible cause for

Table 1: Reported cases of spontaneous epidural haematomas with aetiology

Aetiology	Example
Neoplastic condition	Hepatocelluar carcinoma[4] Eosinophilic granuloma[5] Langerhan's cell histiocytosis[6] Lung carcinoma[7] Ovarian carcinoma[8] Malignant fibrous histiocytoma[9] Ewing's sarcoma[10] Intradiploic epidermoid[11]
Craniofacial infection	Fontal sinusitis[12] Middle ear suppuration[13] Orbital cellulites[14] Pansinusitis[15] Maxillary sinusitis[16] Cleft palate with frontal sinusitis[17] Sphenoiditis[18] Nasal polyps[19]
Coagulation abnormality	Haemophila[20] Hypofibrinogenemia[21] Uraemia[22]
Heart surgery	Open heart surgery[23] Cardiopulmonary bypass surgery[1]

SEDH reported is associated craniofacial infection which was present in 17 of the 55 reported cases.[12-19] Two mechanisms have been proposed for such bleeding. The first is arteritis, which results in weakening of the meningeal vessel wall and causes subsequent bleeding. The second mechanism proposed is progressive detachment of the dura mater from the inner table of the skull by the accumulation of exudates, pus, or air.

The next most common cause reported is bleeding disorders. There are 11 case reports of bleeding disorders causing SEDH. The possible causes mentioned are haemophilia,[20] thrombocytopenia, hypofibrinogenaemia[21] and vitamin K deficiency. Epidural haematomas (EDH) are reported to be caused by chronic renal disease and uraemia.[22] The coagulation abnormalities associated with uraemia or heparin use during haemodialysis may be the factors responsible for the EDH in such patients. Platelet dysfunction, as has been reported in uraemia, may further explain EDH formation in these patients.

There are two case reports of SEDH in patients of cardiopulmonary bypass.[1,23] Ahmad *et al.* reported a case of spontaneous posterior fossa epidural haematoma in a child who had undergone a cardiopulmonary bypass. This was the first reported case of spontaneous posterior fossa extradural hematoma.[1] Other causes of spontaneous extradural haematoma reported are dural vascular anomalies and intradiploic epidermoid cysts.[11]

Knopman *et al.* reported a case of SEDH secondary to venous sinus thrombosis.[24] The mechanism for the development of the haematoma is that the venous haemodynamic pressure increases secondary to poor outflow, causing tension on the proximal venous system. This tension causes blood to dissect between leaflets of the proximal sinus and into the epidural space.

Mastoiditis is known to cause sigmoid sinus thrombosis.[25] Our patient developed spontaneous posterior fossa epidural haematoma secondary to sigmoid sinus thrombosis which was due to mastoiditis. This is the first reported case of SEDH of the posterior fossa in sigmoid sinus thrombosis due to mastoiditis.

Conclusion

Spontaneously occurring EDH is an uncommon entity. Certain conditions have been reported to be associated with SEDH such as craniofacial infections, hepatocellular carcinoma and bleeding disorders. Craniofacial infections are the most commonly associated condition. This is the first case report of sigmoid sinus thrombosis secondary to mastoiditis thus causing EDH of the posterior cranial fossa.

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