acquired after fixed time intervals following intravenous injection of contrast. This imaging technique is described in detail by Jinhu *et al*.[4] On these sequences, a progressive "filling – in" of the contrast is demonstrable. The contrast enhancement first appears in the periphery of the lesion and then progressively "fills-in" the entire lesion in the later sequences. This imaging feature is well described for liver hemangiomas[5] and is also applicable to cavernous hemangiomas.

Further characterization of these hemangiomas is also possible through these special sequences. Zhou *et al*.[6] have subdivided cavernous hemangiomas into three types (A, B and C) according to their histopathological appearances. Type A tumors are tense, pulsatile with a spongy feel and have scarce intra-tumoral connective tissue separating the vascular channels which form these tumors. Type A tumors have a well formed pseudocapsule. Type B tumors have abundant fibrous connective tissue between the vascular channels. They have a more solid "mulberry" feel, lack pulsatility and have a poorly defined pseudocapsule. Type C tumors share the characteristics of both type A and B tumors. Type A tumors demonstrate homogenous contrast enhancement earlier than Type B and C tumors on dynamic imaging.

Cavernous hemangiomas are surgical challenges because of the possibility of rapid intraoperative exsanguination and cavernous carotid injury.[7] Literature prior to 1983 mentions an operative mortality rate as high as 36% for these tumors. Improved understanding of cavernous sinus anatomy, advances in microsurgical techniques and novel hemostatic agents such as fibrin glue and liquid gelfoam, have helped in attenuating the operative risks. However, for adequate pre-operative preparation, surgical success and accurate assessment of operative risks, it is crucial to ascertain the diagnosis of intracavernous lesions on imaging. Dynamic contrast enhanced MR imaging is a useful tool in this regard.

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Infected intraosseous hematoma in an infant

Sir,

Although cephalhematomas in the infant are well-known and frequently seen, intraosseous hematomas are very rare. Hematomas in the infant may occure in the subcutaneous, subaponeurotic, or subperiostal spaces.[1] Pathogenesis of hemorrhage from the intraosseous space is stil unclear and this lesions are rarely observed. Only 11 cases have been reported in the English literature including childs and adults.[2] We present the first case in the literature of an infected intraosseous hematoma in a 60 days infant with no hematological disorder.

A 60-day-old male child was admitted with swelling on the left parietal side of the head at the time of delivery. The infant was born by uncomplicated spontenous vaginal delivery with an uneventful pregnancy. The skull mass was presumed to be a cephalhematoma. The family was counseled that the swelling I benign and resolve over a period. At 8 weeks after the delivery, the mass progressively increased. Physical examination revealed a 3 cm × 1 cm palpable lesion in the left parietal area under the normal scalp. The infant had no neurological deficit cranial ultrasound showed fluid collection in the intraosseous area. Computerized tomography (CT) performed and an iso dense calcified mass under the parietal bone with expansion and scalloping of the bony margins, consistent with an intraosseous hematoma was detected. The outer wall of the skull was thinned out and there were lytic lesions in the inner wall [Figure 1a]. Following appropriate skin incision surrounding the lesion and raising the bone flap, the lytic lesions in the inner wall of the bone flap were seen [Figure 1b].

The inner wall of the bone flap was excised and a jelly like organized hematoma with liquefied clot was evacuated [Figure 1c]. The dura was yellowish and rigid. The outer wall of the bone flap was reconstructed and replaced. Samples from the lesion were taken for culture. Histological examination revealed normal and thick bone trabeculae, inflammatory infiltration in the intertrabeculae area and hemorrhage. The same findings were seen surrounding soft-tissue. There was no problem in the post-operative period. Control post-operative CT showed nothing except post-operative changes [Figure 2]. Furthermore, no pathogen cultured from the lesion.

Although the exact mechanism of intraosseous hematomas unknown. Review of English literature revealed 11 cases of intraosseous hematoma. All had trauma while four of them also had hematologic disorder.[2] Two of them were infant and except one case, they were treated surgically. None of the histopathological examination of the cases revealed infection. There was inflammatory infiltration in histopathological examination of our case. The hematogen spreading may lead the infection.

In general, risk factors such as hemophilia or other coagulation disorders will place the patient at risk for intraosseous hematoma. Furthermore intraosseous hematomas can occur even in the absence of coagulation disorders. Trauma initiates bleeding into the intraosseous space. The slowly progressive enlargement of the skull is due to organization of the hematoma. Intraosseous hematomas cross the sutures unlike supperiostal hematomas.[3] In a pediatric skull, micro movements at the sutural levels, which might be spontaneous or follow trivial trauma may lead to the formation of hematoma.[3] Our patient was an infant boy who had difficult vaginal delivery. He had not have any hematologic disorder. In the differential diagnosis of intraosseous hematoma, aneurysmal bone cyst, dermoid and epidermoid cysts, eosinophylic granuloma, hemangioma and plasmacytoma should be considered.[3] Intraosseous hematomas are able to be diagnosed pre-operatively with suspicion and experience. CT and magnetic resonance images scans typically demonstrate the non-contrast enhanced mass, expanded in the diploe and separated the inner and outer wall of the skull. Histopathological examination of these lesions show evidence of old hematoma either in the form old altered blood encysted or pure blood clot, or an empty cyst wall of granulation tissue or collagenous tissue.[4] In our case, there was also inflammatory infiltration. This is the first case of infected intraosseous hematoma. Intraosseousc hematoma is a lesion that must be differentiated from skull lesions both radiologically and histologically.

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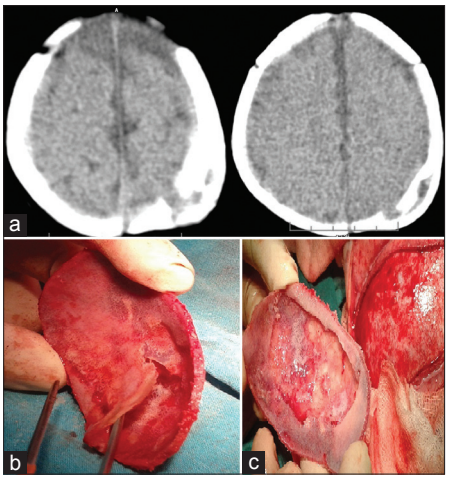

Figure 1: (a) Axial computerized tomography scan showing iso dense intradiploic lesion (b and c) the organized jelly like hematoma and lytic lesions of inner wall of the skull

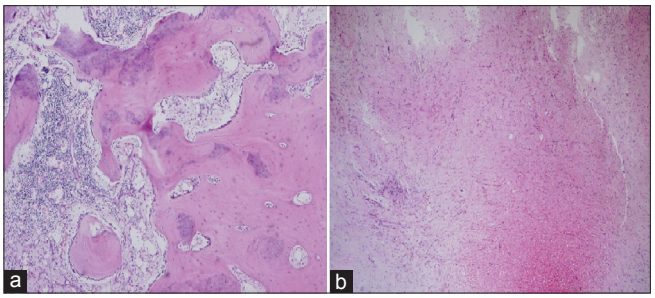

Figure 2: (a) Thickened bone trabeculas and inflammatory inflammation (b) hemorrhage area of surrounding soft-tissue

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