Case Report

Chronic intradiploic hematomas of the skull without coagulopathy: Report of two cases

Mehmet Tokmak a,∗, Erdinc Ozek a, Celal Iplikçiö̈glu b

a Neurosurgery Department, Medipol University, Istanbul, Turkey
b Neurosurgery Department, Harran University, Urfa, Turkey

Abstract

Background: Chronic intradiploic hematoma was first described by Chorbski and Davis in 1934. To date, only twelve cases have been reported in the literature. Chronic intradiploic hematomas have also been described as non-neoplastic cysts of the diploe, traumatic cysts, and giant cell repetitive granulomas. The term chronic intradiploic hematoma was coined by Sato et al. in 1994.

Case description: Case 1: a 16-year-old male presented with a non-tender scalp swelling on the right fronto-orbital region. Computed tomography (CT) scans showed an intrasosseous isodense lesion with surrounding sclerosis. Magnetic resonance imaging (MRI) results revealed an intradiploic mass with homogeneous cystic and abnormal signal intensities. Case 2: a 64-year-old male presented with a 6-month history of headaches and visual disturbances. CT scans showed an isodense lesion with surrounding sclerosis in the posterolateral left orbit. MRI results revealed a hypointense lesion on both the T1-weighted and T2-weighted images of the posterolateral left orbit.

Conclusion: Although rarely seen, the presence of a benign chronic hematoma should be considered as part of the differential diagnosis for each intradiploic mass lesion. When taking the medical history, all patients with such mass lesions should be asked about previous minor or major head traumas. Due to the possibility of progressive growth, surgical excision of an intradiploic hematoma is recommended after radiological diagnosis of the condition.

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Hematoma crónico intradiploico sin coagulopatía: informe de 2 casos

Resumen


∗ Corresponding author.
E-mail address: drmehmettokmak@gmail.com (M. Tokmak).
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Introduction

A chronic intradiploic hematoma is a rare type of lesion that usually presents as a slowly growing skull mass following a minor head injury. Although the pathogenesis is not clear, a benign reparative reaction to traumatic diploic bleeding is suspected to be the cause of the cyst formation. We present two cases of chronic intradiploic hematoma without coagulopathy after minor trauma.

Case reports

Case 1

A 16-year-old male presented with a non-tender scalp swelling on the right fronto-orbital region. He had a history of a minor head trauma in the same region two years earlier, and the aforementioned scalp swelling started one year after the trauma. A neurological examination was unremarkable. No pain was associated with the lesion; moreover, the lesion was not soft and showed no signs of inflammation. All hematological and biochemical tests were normal. X-rays of the cranium showed a large round osteolytic lesion in the right fronto-orbital bone with surrounding sclerosis (Fig. 1). Non-contrast CT scans showed an intraosseous isodense lesion with surrounding sclerosis, expansion of the diploe, and erosion of the inner and outer tables. MRI results revealed an intradiploic cystic mass that was hyperintense on both T1- and T2-weighted sequences (Fig. 2). No abnormalities were observed in the adjacent brain tissue. In surgery to treat the lesion, we noticed that the outer and inner tables were damaged by the cyst. A brownish fluid was evacuated from the cystic lesion, and the effected bone was totally curetted. Light microscopy of the specimen obtained from the cyst revealed fibrous material with hemosiderin-laden macrophages. Light microscopy of the curetted bone specimen showed fibroblastic reactions with hemosiderin-laden macrophages and lymphocytes (Fig. 3a and b). These features are consistent with an organizing hematoma. The postoperative course was uneventful.

Case 2

A 64-year-old male presented with a 6-month history of headaches and visual disturbances. The patient had suffered a minor head trauma one year before admission. Physical examination revealed swelling over the left frontal bone. The mass was non-pulsatile, and the patient reported no tenderness upon palpation. The neurological examination was normal, and the patient’s hematological and biochemical profiles were unremarkable. X-rays of the skull were normal. Non-contrast CT showed an isodense lesion with surrounding sclerosis in the posterolateral of the left orbit. The bone defect was irregular and involved both the external and inner tables. MRI revealed a hypointense lesion on both the T1-weighted and T2-weighted images; this lesion had a diameter of 1.5 cm.
Discussion

The chronic intradiploic hematoma lesion was first described by Chorbski and Davis in 1934 and was named by Sato et al.7 To date, only 12 cases of chronic intradiploic hematoma have been reported in the literature.1-11 Other names found in the literature for intradiploic hematoma include non-neoplastic cyst of diploe, traumatic cyst, and giant cell repetitive granuloma.5,6,9,10,12

The exact pathogenesis of the intradiploic hematoma is not clear. However, chronic intradiploic hematomas associated with anticoagulant use, birth trauma, and shunt surgery have been reported. Moreover, acute hematomas in the various layers of the scalp and the skull usually resolve spontaneously.1 However, trauma can initiate bleeding in the diploic space. If the resulting diploic hematoma is not absorbed, the surrounding connective tissue usually encapsulates the hematoma and creates a cyst.1 The natural history of this connective tissue can show various stages of differentiation, i.e., fibrous tissue, osteoid tissue, and sometimes osseous tissue, followed by the disappearance of all foreign elements.1,13 Intradiploic hematomas can cross the sutures, while subperiosteal hematomas cannot.

The literature reports of patients with chronic intradiploic hematomas usually describe some common features for the patients. The patients are usually young adult males, yet children with intradiploic hematomas have been also reported.3,4,7,8,11 The hematological and biochemical profiles of the patients in the literature were normal with exception in three patients who had a factor VIII deficiency, thereby causing progressive growth in the size of the hematoma after diagnosis.3,4,13 Only one patient had suffered a major head injury 2 years prior to the skull mass occurrence.7 Although the parietal and frontal bones were the most affected sites,
temporal and occipital bones were involved in cases. The cases in this report shared similar features with the previously reported cases.

Skull films reveal the expansion of the diploe in cases of hyperostosis or the thinning of the inner and outer tables. The outer table of the skull was intact in all cases except three, including the two cases in the present report; in these three cases, both the outer and inner tables were destroyed. CT can reveal intradiploic masses of varying densities. However, Yuasa et al. stated that CT may not be sufficient to determine if the lesion is interosseous, epidural, or subdural. MRI examination was first used to diagnose intradiploic hematomas by Sato and colleagues. In contrast to CT, MRI provides more precise information, which allows for the determination of the type of bone lesion, and demonstrates the exact location of the lesion and extent of the lesion’s effects on the adjacent structures. MRI reveals variable signal intensities for lesions within the diploic space. Contrast enhancement was observed in only one case. In both of the cases presented in this paper, the lesions appeared isodense in CT scans. However, the intradiploic mass was hyperintense in T1- and T2-weighted MRI images in case 1 in this report, but

<table>
<thead>
<tr>
<th>Author/year</th>
<th>Age/sex</th>
<th>Features</th>
<th>Bone</th>
<th>Radiology/imaging</th>
<th>Histopathology</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercado 1984</td>
<td>31 months/M</td>
<td>Minor head injury 10 months of age. Swelling noted 2 months later</td>
<td>Parietal</td>
<td>Inner table intact. Outer table expansion</td>
<td>Giant cell reparative granuloma</td>
<td>Excision and cranioplasty</td>
</tr>
<tr>
<td>Palantinsky 1986</td>
<td>70 years/M</td>
<td>Minor head injury 40 years prior, scalp swelling noted after injury</td>
<td>Parietal</td>
<td>Inner and outer table eroded</td>
<td>Vascularized granulation tissue + macrophages with vacuoles and hemosiderin. FB giant cells – chronic intradiploic hematoma. Collagenous tissue. Cystic lesion within diploe containing nothing – dense wall of bone</td>
<td>Excision and cranioplasty</td>
</tr>
<tr>
<td>Yuasa 1992</td>
<td>20 years/M</td>
<td>Minor head injury at 15 years of age. Incidental finding at later date</td>
<td>Parietal</td>
<td>Inner table expansion</td>
<td></td>
<td>Excision and cranioplasty</td>
</tr>
<tr>
<td>Sato 1994</td>
<td>20 years/M</td>
<td>Minor head injury 4 years prior. Incidental finding at later date</td>
<td>Parietal</td>
<td>MRI: high intensity with low Central area on T1. T2 low intensity with high central area. Contrast enhancement noted.</td>
<td>Central cyst with xanthochromic fluid. Cyst wall consisted of non-neoplastic granulation tissue</td>
<td>Excision and cranioplasty</td>
</tr>
<tr>
<td>Goel 1996</td>
<td>17 years/M</td>
<td>Minor head injury. Progressive scalp swelling/proptosis for 8 years with hemiphilia</td>
<td>Frontal</td>
<td>CT: intradiploic lesion expanding frontal bone</td>
<td>Intraosseous hematoma</td>
<td>Evacuation of hematoma</td>
</tr>
<tr>
<td>Uemura 1999</td>
<td>32 years/M</td>
<td>Minor head injury at 13 years of age with intermittent headaches</td>
<td>Frontal</td>
<td>MRI: intradiploic mass with heterogeneous intensity on T1</td>
<td>Organizing hematoma</td>
<td>Excision</td>
</tr>
<tr>
<td>Yucsesoy 1999</td>
<td>25 days/M</td>
<td>Birth trauma. Scalp swelling noted after difficult delivery</td>
<td>Parietal</td>
<td>CT: isodense lesion with surrounding sclerosis</td>
<td>Granulation tissue and organizing hematoma</td>
<td>Excision</td>
</tr>
<tr>
<td>Mobbs 2000</td>
<td>3 years/M</td>
<td>Major head injury 2 years prior</td>
<td>Parietal</td>
<td>CT: Inner table intact Outer table expansion</td>
<td>Organizing hematoma</td>
<td>Curettage</td>
</tr>
<tr>
<td>Goel 2000</td>
<td>58 years/M</td>
<td>Minor head injury 4 years prior. Swelling/proptosis</td>
<td>Frontal</td>
<td>CT: intradiploic lesion Expanding frontal bone</td>
<td>Organizing hematoma</td>
<td>Excision</td>
</tr>
<tr>
<td>Present case 1</td>
<td>16 years/M</td>
<td>Minor head injury 2 years prior. Swelling noted 1 year later</td>
<td>Frontal</td>
<td>CT: isodense lesion with surrounding sclerosis</td>
<td>Organizing hematoma</td>
<td>Excision</td>
</tr>
<tr>
<td>Present case 2</td>
<td>64 years/M</td>
<td>Minor head injury 1 year prior. Swelling noted after sclerosis</td>
<td>Frontal</td>
<td>CT: isodense Lesion with surrounding admission</td>
<td>Organizing hematoma</td>
<td>Curettage</td>
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</tbody>
</table>
the intradiploic mass was hypointense in T1- and T2-weighted images for case 2 in this report. This variation is probably due to the age of and the organization of the hematoma.

A correct diagnosis could only be established after a histopathological examination, which can differentiate between an old hematoma and a cyst with a wall of granulation tissue or collagenous tissue. New bone formation also could be observed in some cases.4,6,9–12 Chronic intradiploic hematomas may radiologically or histologically resemble giant cell tumors, aneurysmal bone cysts, giant cell reactive granulomas, or fibrous dysplasia. Some authors believe that intradiploic hematomas and the giant cell repetitive granulomas are produced by the same process.7 However, giant cell repetitive granulomas are usually seen in the mandible and considered as a local reparative reactive process following a traumatic intraosseous hemorrhage; furthermore, histological examinations show reactive osteoclast-like giant cells and fibroblastic cells.13,14

Total surgical removal of the hematoma is the treatment of choice for chronic diploic hematomas. No additional treatment is typically required. In some cases, reconstructive cranioplasty might be useful for either cosmetic or protective reasons. Since most of these lesions are in the frontal visible region, we recommend including cosmetic cranioplasty within the same surgical procedure. However, some authors preferred to preserve the intact inner table in cases when the inner table is thin and compressible.3

Conclusion

Although rarely seen, the presence of a benign chronic hematoma should be considered as part of the differential diagnosis in each case of an intradiploic mass lesion. All patients with such lesions should be asked about previous minor or major head traumas in the area under investigation. Due to the progressive growth possibility, we recommend surgical excision of the intradiploic hematoma after radiological diagnosis.

REFERENCES