Case report

Ossification of a Post-Traumatic Low Frontal Subcutaneous Hematoma Treated via Trans-Eyebrow Approach: A Clinical Case

Background: Post-traumatic hematomas can be subcutaneous or subperiosteal, with the latter being rare outside the neonatal period. These hematomas typically resorb spontaneously but can occasionally ossify. Ossification is extremely rare and may occur in the context of carcinosis.

Case Presentation: We report a case of a 13-year-old child who sustained a head injury in November 2022. The injury occurred when the child was accidentally struck on the head by a neighbor while watching a football match. The initial symptoms included a painful swelling in the right periorbital region, rated 8/10 on the visual analogue scale, with no loss of consciousness. The pain resolved within two weeks without treatment, but the swelling persisted and progressively increased in size. Six months later, the swelling was treated with warm water massage and local ointments. Due to the persistence of the mass, the patient was referred to neurosurgery. Examination revealed a hard, bony swelling in the right fronto-naso-orbital region. A CT scan showed a calcified formation measuring 20x36x41 mm, confirmed after surgery by trans eyebrow approach.

Discussion: Post-traumatic orbitofrontonasal swellings result from lesions of the vessels, either subcutaneous, muscular, or subperiosteal, likely with an associated hematoma. These hematomas generally evolve towards resorption. However, in rare cases, unresorbed hematomas may calcify after 11 months. This phenomenon is often associated with subperiosteal hematomas. The case presented highlights the rare progression of a subperiosteal hematoma to ossification, emphasizing the need for careful monitoring and timely intervention.

Conclusion: This case underscores the importance of monitoring post-traumatic hematomas for potential complications such as calcification, even in pediatric patients. Early recognition and appropriate management are crucial to prevent long-term sequelae.

Key words: Post-traumatic hematomas, Subcutaneous hematomas, Ossification, Head injury

Introduction:

A hematic post-traumatic skin swelling, following fine puncture-aspiration, may be subcutaneous or subperiosteal. A post-traumatic subcutaneous hematoma is an accumulation of blood between the skin and the periosteum. It generally evolves towards spontaneous resorption, with ossification being extremely rare and potentially occurring in the context of carcinosis. A subperiosteal hematoma is the accumulation of blood between the periosteum (pericranium) and the bone. It can occur during the neonatal period but is rare at other ages. It can be self-absorbed in most cases and can sometimes cause ossification. We report a case of post-traumatic low frontal swelling of the right periorbital region, which progressed to ossification when operated on via the transorbital approach.

Clinical Case:

A 13-year-old child was the victim of an accidental blow in November 2022. He was hit on the head by his neighbor while watching a football match on television. The painful swelling was assessed at 8/10 on the visual analogue scale. There was no initial loss of consciousness. The pain disappeared completely without any treatment two weeks later, but a progressive increase in the size of the tumor was noted. The tumor was treated with warm water massage and local ointments six months later due to the persistent mass. The patient was then referred to neurosurgery. Examination revealed a hard, bony swelling in the right fronto-naso-orbital region. A CT scan revealed a calcified formation measuring 20x36x41 mm in the right frontal sinus, suggestive of an osteoma (Figures 2 and 3). Surgical excision of the mass by bilateral trans-eyebrow approach (Figure 4) allowed the removal of a calcified bone mass about 5 cm in diameter (Figure 5) with good postoperative follow-up, no infection, and good healing (Figure

6).The pathological anatomy examination reveals that it is a bone mass without any notion of malignancy.

Discussions

Post-traumatic orbitofrontonasal swellings result from lesions of the vessels, either subcutaneous, muscular, or subperiosteal, probably with an associated hematoma. The evolution of this hematoma is generally towards resorption. After 11 months, unresorbed post-traumatic hematomas may calcify. It is found in calcinosis, and only subperiosteal hematomas have been described, evolving exceptionally towards ossification. These hematomas mainly affect the skull, the maxillofacial region, the orbit, and the iliac wing[2-7]. They occur in children and young adults and are mainly due to closed trauma; they are acute lesions occurring in the aftermath of direct, violent trauma[8-10]. A calcified hematoma can still be absorbed slowly and often disappears over 3 to 6 months. Exceptionally, post-traumatic hematomas evolving into aneurysmal bone cysts have been described in hematomas under the iliac periosteum.

The hematoma described in our patient evolved towards ossification. Osteogenesis is probably due to the combined action of certain factors active in the blood and a certain tension of the hematoma on the local periosteum. Osteogenic progenitor cells in the periosteum, cytokines, and growth factors in the hematoma play a role in the ossification process, similar to events occurring at the healing fracture site. The occurrence of ossification of the hematoma suggests that the periosteum of a 13-year-old adolescent has great potential for osteogenesis. This suggests that a subperiosteal hematoma that has not been absorbed after 1 month should be treated rapidly to avoid ossification. The potential for periosteal osteogenesis is great, which may give a new idea to cranioplasty.

Ossification of the hematoma in the orbitofrontonasal region creates an unsightly swelling on the face, especially when it is lateralized, as in the case of our patient.

Once ossification has occurred, the hematoma must be treated surgically. (2). Two surgical approaches are indicated: the bicoronal incision, which is more invasive, especially when the hair implantation is high, and the trans-eyebrow incision, which is minimally invasive and more aesthetic, as the scars are covered by the eyebrows. Given the size of the swelling, we opted for the bilateral trans-eyebrow approach. Intraoperatively, an ossified mass of almost 5 cm^3 was found, attached to the joint between the nasal spine of the frontal bone and the clean bone of the nose, confirming the subperiosteal origin of the initial hematoma. Assessment of the incision two years later appeared discreet and unnoticed.

CONCLUSION,

A trivial trauma can lead to hemorrhagic swelling, creating a hematoma. This hematoma can evolve, independently of its size, towards ossification, which can be treated surgically. The surgical treatment is aesthetic, with the scar completely covered by the eyebrows.

Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

Consent

As per international standards, parental written consent has been collected and preserved by the author(s).

.

.

FIg1 :fronto-orbito-nasal swelling

Fig 2 et 3 :Craniofacial CT scan in bone window showing calcification

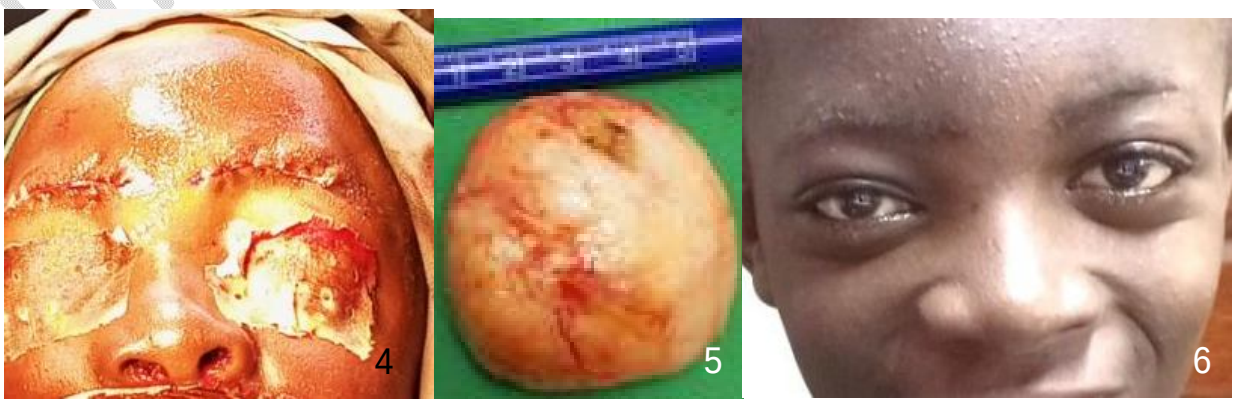

Fig4 :bilateral trans eyebrow incision, FIg5 frontonasal osteoma extracted, fig6: postoperative scarring

References

1- B. Bienvenu, Treatment of subcutaneouscarcinomatosis of connective tissue diseases -THE JOURNAL OF INTERNAL MEDICINE, 06/20/14, doi: 10.1016/j.revmed.2014.04.018.

2- Wang, Yong MD ; Zhang, Jiliang BS, Ossification of subperiostealhaematoma ,The potential of periosteal osteogenesis in cranioplasty, ARTICLES P3 ,Ooriginals Journal of Craniofacial Surgery 24(5):p 1603-1605, September 2013. | DOI: 10.1097/SCS.0b013e3182a20ffb ;

3- Peter Hughes , David Dow, Lucinda Boyer , Vicki Morganti ; Chronic ossifying subperiostealhaematoma of the iliac bone, J Med Imaging RadiatOncol. August 2019; 63(4):479-480.

4- M Mbaye, ELC Ndiaye Sy, Y Cisse, LF Barry, AB Thiam, M Thioub, N Ndoye, MC Ba, SB Badiane Infant ossified cephalohaematoma: A case report and review of the literature Infant ossified cephalohaematoma: a case report, Health Sci. Dis: Vol 21 (6) June 2020 p 101-103 Available free at www.hsd-fmsb.org

5- Chida K, Kubo N, Suzuki T, et al. Surgical treatment of ossified cephalhematoma: a case report. No ShinkeiGeka. 2008; 36:529-533.

6- Wang, Yong ,Zhang Jiliang, Ossification of subperiostealhaematoma,The potential of periosteal osteogenesis in cranioplasty, Original articles ,Journal ofcraniofacial surgery 24(5):p1603-05,september2013. | DOI 10.1097/SCS. 0b013e3182a20ffb

7- Peter Hughes, David Dow, Lucinda Boyer, Vicki Morganti , Chronic ossifying subperiostealhaematoma of the iliac bone ,Medical imaging-Case of the month,Journal of

Medical Imaging and Radiation Oncology, 14 March 2019 - Volume 63, Issue 4 p. 479 and 480, https://doi.org/10.1111/1754-9485.12869

8- Unay a, S. Coffin a, A. Chatellier b, A. Arion c, J.C. Quintyn a, A.L. Lux Ossification of a post-traumatic subperiosteal orbital hematoma: Case report ,Journal Françaisd'Ophtalmologie ,Volume 42, Issue 9, November 2019, Pages e423-e425

9- J. Ben Zakoun,B. Dallaudière,E. Palazzo , M. Lefere ,J. Monteil,P. Dieudé ,A chronic ossified subperiostealhaematoma of the iliac wing,2014, Journal of Diagnostic and Interventional Radiology ,P879-81 pttp://dx.doi.org/10.1016/j.jradio.2014.02.003

10- Guillin R, Moser T, Koob M, Khoury V, Chapuis M, Ropars M, et al. Subperiosteal hematoma of the iliac bone: imaging features of acute and chronic stages with emphasis on pathophysiology. Skeletal Radiol 2012;41(6):667-75.

11- Rosenberg AE, in Kumar V, Abbas AK, Fausto N (eds), Robbins and Cotran's. Bone, joints and soft tissue tumors. Pathological Basis of Disease, ed 7. Elsevier Saunders, 2005; p 1288