Case Report / Olgu Sunumu

A very rare complication of acute sinusitis: subgaleal abscess

Akut sinüzitin çok nadir bir komplikasyonu: Subgaleal apse

Hatice Çelik, M.D.,[1] Ahmet İslam, M.D.,[1] Sevim Aslan Felek, M.D.,[1] Dilek Yüksel, M.D.[2]

Departments of [1]2nd Otolaryngology, [2]Ophthalmology, Ankara Training and Research Hospital, Ankara, Turkey

A 12-year-old girl presented with a swollen right eye with three days of pain and a diffused swollen frontal region and head lasting for one day. On the computed tomography with contrast, diffused collection was detected in the subgaleal regions and subperiosteal of the right orbita. It was observed that she had bilateral maxillary, ethmoidal, and frontal sinusitis and an infected bilateral middle concha bullosa in the right side. No symptoms of intracranial complication and osteomyelitis in the frontal or other calvarial bones were determined. This case presentation is thought to be the first one in literature that is an acute sinusitis without an intracranial complication and osteomyelitis, but with a diffused subgaleal abscess resulting from a subperiosteal abscess.

Key Words: Acute sinusitis; orbital subperiosteal abscess; subgaleal abscess.

On iki yaşındaki kız çocuğu üç günlük ağrılı sağ göz şişliği ve son bir gün içinde yaygın alın ve kafa şişliği yakınmaları ile başvurdu. Kontrastlı bilgisayarlı tomografisinde sağ orbitada subperiostal ve subgaleal alanda yaygın kolleksiyon tespit edildi. Olgunun iki taraflı maksiller, etmoid, frontal sinüziti ve sağ enfekte iki taraflı orta konka büllozasının olduğu izlendi. Frontal kemikte ve diğer kalvarial kemiklerde osteomiyelit bulgusu ve intrakraniyal komplikasyon tespit edilmedi. Bu yazıda, akut sinüzitin intrakraniyal komplikasyon ve osteomiyelit oluşturmaksızın, orbital subperiosteal apseye bağlı gelişen yaygın subgaleal apse ile giden ve literatürde ilk olduğu düşünülen bir olgu sunuldu.

Anahtar Sözcükler: Akut sinüzit; orbital subperiostal apse; subgaleal apse.

Subgaleal collections are formed out of the calvarium but between the pericranium and galea or epicranial aponeurosis. In the literature, known reasons of the subgaleal abscess (SGA) were reported as scalp lacerations, wound infection following neurosurgery, the contamination of subgaleal haematoma with needle aspiration, contamination with electrode insertion in fetal cranium monitorisation or hematogen diffusion from any skin lesion.[1-4] Although many cases of intracranial infections, abscess or meningitis resulting from a complication of sinusitis have been reported previously, according to our literature review, no case of diffused abscess formation in the subgaleal region with only orbital subperiosteal abscess (SPA) resulting from sinusitis has been reported yet. In this case presentation, a diffused SGA developing with an orbital SPA resulting from an isolated acute sinusitis without formation of osteomyelitis in frontal bone and diffusion of intracranial infection in a 12-years-old girl is reported.

CASE REPORT

A 12-year-old girl applied to our emergency clinic complaining of a progressive swollen right eye for three days and a swollen region in the right frontal

Received / *Geliş tarihi:* November 8, 2007 Accepted / *Kabul tarihi:* May 16, 2008

Correspondence / İletişim adresi: Hatice Çelik, M.D. 102/14, 4. Cad., 06510 Emek, Ankara, Turkey.
Tel: +90 312 - 595 35 62 Fax *(Faks):* +90 312 - 363 33 96 e-mail *(e-posta):* hatmut66@mynet.com

lasting for one day. In the history obtained from the patient, there was not any information about the symptoms of rhinosinusitis, upper respiratory way infection, and the cranial trauma. Her body temperature was measured as 38.7 °C. During inspection, a diffused edema and hyperemia was detected in the right eye upper lid. In addition to these findings, during the upward look an ophthalmoplegia and a right proptosis, and also a localized, sensitive swollen region was present (Fig. 1).

Fig. 1. *Preoperative photograph of the patient. Swollen of right eye and frontal region (black arrow) is seen on photograph.*

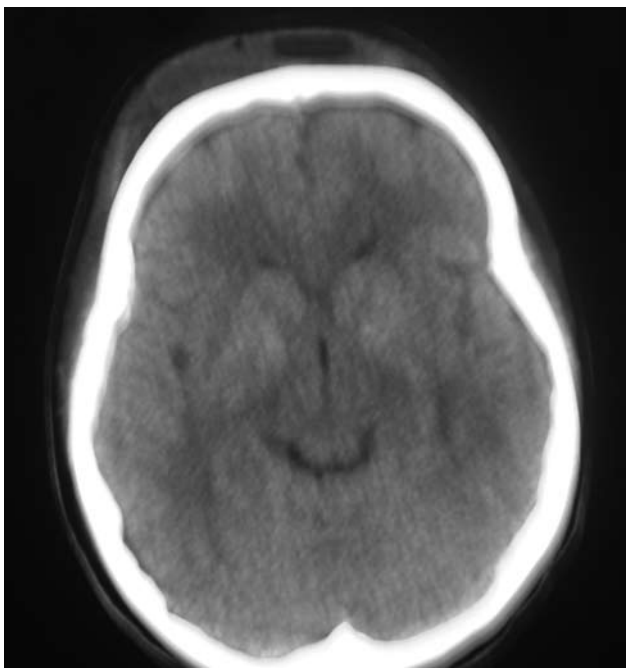

Fig. 2. *The appearance of subgaleal abscess demonstrating air-liquid level extending to parietal region in the subgaleal area and to the anterior of the frontal bone on the computed tomography with contrast.*

During the endoscopic nasal inspection, no other pathological finding, except purulent secretion originating from middle mea in the right nasal cavity and a bilateral bullous middle concha, was detected. During the ophthalmological measurement the vision sharpness was found as 6/6. The left eye inspection was normal. In the neurological inspection no abnormal finding was determined. Laboratory studies were significant for white blood cells (WBC) count of 18.500/mm^3. The sedimentation rate was 70 mm/hr. Prothrombin time and partial thromboplastin time were within normal limits.

Computed tomography (CT) examination was done under intrenenous (i.v) radio opaque material delivery. In the brain and orbita CT, on the anterior of the frontal bone a hypodense collection area measured as 43x8 mm in the largest part of air-liquid level in the subgaleal region and the 20x10 mm subcutaneous collection area in the level of external cantus on the right side were considered in the inferior of the SGA (Fig. 2). A collection of SPA, having dimensions of 6x7 mm was determined in the superior of the rectus muscle and bulbus occuli in the level of orbita on the right side. Bilateral bulbus occuli extraoculer muscle structure and the appearance of the optic nerve were evaluated as normal. The cranial bone structures were normal and no osteomyelitis finding was seen in the CT (Fig. 3). Also, no finding in accordance with an intra/extra axial hemorrhage or an intracranial abscess, or a subdural abscess was determined.

Fig. 3. *The appearance of right orbital abscess and paranasal sinus illness without any sign of osteomyelitis on the computed tomography with contrast.*

In the CT examination of the sinuses, an appearance consistent with bilateral maxillary, ethmoidal, and frontal sinusitis and infected middle concha bullosa was inspected.

Considering these symptoms, drugs were delivered to the patient in the following order: intraveneous ceftriaxon 50 mg/kg/day in two periods, i.v metronidazole 30 mg/kg/day in three periods, and oral ibuprofen suspension 10 mg/kg/day in two periods.

The swollen area was limited in the frontal region in the first inspection. However, 12 hours after the admission of the patient, the swollen area extended to arcus zygomaticus anterolaterally in the right side of the face, to frontal area in the front, to parietooccipital area border in the posterior, to temporal area in the right lateral, and approximately 3 cm over the middle-line in the parietal region changing into SGA. The patient was conscious, cooperative, and did not have any pain complaint. Under general anesthesia, needle aspiration was performed and 20 cc inflammatory liquid was drained. Then, with the right eye-brow incision and an incision from the subgaleal area and right superior orbital rim to the periosteum, a great amount of yellow purulent abscess content was drained. A penrous drain was placed and the incision was sutured. Five days after the drainage, the drain was removed. The patient was discharged on the postoperative tenth day. No growth was observed in the culture obtained from needle aspiration content. The intrenenous antibiotics therapy lasted for 10 days. Following this therapy, cefuroximaxetyl was delivered orally up to six weeks. After six weeks, it was determined that the patient recovered clinically; however, in the control paranasal CT scan it was noticed that sinusitis was still present in the right side. Therefore, under general anesthesia, right maxillary osteoplasty, anterior ethmoidectomy, and right medial concha lateral resection were applied to the patient. Also, right frontal recess was opened. In the paranasal CT, taken one month after the operation, it was noticed that sinuses were clear. In the postoperative first year recall, no complication and recurrence was observed.

DISCUSSION

Sinusitis is still a life-threatening condition and if neglected, or mismanaged, can lead to intracranial complications that result in a high mortality and morbidity. Despite advances in medicine, i.e. antibiotics and CT scan for early and accurate diagnosis, the mortality from sinogenic intracranial complications has remained significant.[5-7]

The subgaleal abscess is an extracranial complication and it is different from the subperiosteal and subcutaneous abscesses in terms of its widespread, massive, extensive scalp elevation extending over to the suture lines. In the subgaleal area, small blood-vessels are predominant and emissary veins are in relation with dural sinuses with the superficial veins of the scalp.[1,8] This is an open transition for intracranial infection. In this case, it was noticed that widespread abscess was present in the subgaleal area without any intracranial complication.

The subgaleal abscess formation following scalp laceration is well documented in literature. An abscess formation following subgaleal hematoma has been reported rarely. Only one case was reported related to SGA hematogenically spreading from the skin lesion following chicken-pox.[8] However, to our knowledge, there is not any case of subgaleal abscess due to sinusitis with only orbital SPA without any intracranial complication and osteomyelitis of frontal bone in the literature.

The thin lamina paprisea, forming the medial wall of the orbita, is a weak barrier. The orbital SPA is generally formed by direct hematogenic or lymphatic spreading of the ethmoidal sinusitis moving into the lamina paprisea.[9-12] In the present case it is thought that sinusitis caused subperiosteal orbital abscess and this abscess, then, reached to the subgaleal area over orbital ridge. It is assumed that the transition between these two anatomic structures occurred either by necrosis or by the transition of the orbital SPA to the galeal area under the effect of high pressure and the destruction of the low resistant tissue structures by the infection.

The anatomical disturbances of nose and sinuses cause the nose passage and osteomeatal complex to become narrow, and then finally leads to sinusitis. One of the common anatomical disturbances is concha bullosa which causes sinus ostium obliteration, mucosiliary clearance disorder, and inflammatory illness development by making the medial mea narrower. When the medical therapy is not successful, such kind of anatomical or structural abnormalities are put in order surgically.[13,14] Limited functional endoscopic surgery was applied to our patient because of the bilateral infected concha bullosa and the sinusitis not recovered with the medical therapy.

No growth in the culture was observed due to the parenteral antibiotics delivery previously. Generally the most common therapeutic approach is the drainage of the abscess and the delivery of the antibiotics. Also, in our case following the abscess drainage, antibiotic therapy lasted for six weeks. Meanwhile, in the control CT scan, the sinusitis was still present. In order to prevent the recurrences, limited functional endoscopic sinus surgery was applied to the patient. In the first year recall no recurrence was observed and the sinuses were determined as clear. This patient is still under follow-up.

In conclusion because of the potential life threatening complications, sinusitis is an important illness. Without causing osteomyelitis and intracranial complications, sinusitis may rarely result in widespread SGA accompanied with orbital SPA.

In the cases of SGA, the situation and the conditions of the sinuses should be evaluated, and in a patient with sinusitis SGA development also must be taken into consideration among the extra cranial complications.

REFERENCES

1. Kuban K, Winston K, Bresnan M. Childhood subgaleal hematoma following minor head trauma. Am J Dis Child 1983;137:637-40.
2. Chen CH, Hsieh WS, Tsao PN, Chou HC. Neonatal subgaleal abscess. Eur J Pediatr 2004;163:565-6.
3. Razzouk A, Collins N, Zirkle T. Chronic extensive necrotizing abscess of the scalp. Ann Plast Surg 1988; 20:124-7.
4. Janknecht P, Hammerich T, Soriano JM, Hansen LL. Chronic subgaleal abscess as a cause of eyelid swelling. Klin Monatsbl Augenheilkd 1991;199:439-41. [Abstract]
5. Tutar H, İleri F. Rinosinüzit komplikasyonları. Türkiye Klinikleri Acil Tıp Dergisi 2006;2:90-5.
6. Güven M, Süoğlu Y, Erdamar B, Cölhan I, Demir D. Orbital complications of acute sinusitis. [Article in Turkish] Kulak Burun Bogaz Ihtis Derg 2004;12:115-9.
7. Soylu L, Aydoğan LB, Özdemir S. Rinosinüzit komplikasyonları. Türkiye Klinikleri Cerrahi Tıp Bilimleri 2005;1:33-8.
8. Wiley JF 2nd, Sugarman JM, Bell LM. Subgaleal abscess: an unusual presentation. Ann Emerg Med 1989;18:785-7.
9. Samad I, Riding K. Orbital complications of ethmoiditis: B.C. Children's Hospital experience, 1982-89. J Otolaryngol 1991;20:400-3.
10. Durand B, Poje C, Dias M. Sinusitis-associated epidural abscess presenting as posterior scalp abscess-a case report. Int J Pediatr Otorhinolaryngol 1998;43:147-51.
11. Pond F, Berkowitz RG. Superolateral subperiosteal orbital abscess complicating sinusitis in a child. Int J Pediatr Otorhinolaryngol 1999;48:255-8.
12. Sobol SE, Marchand J, Tewfik TL, Manoukian JJ, Schloss MD. Orbital complications of sinusitis in children. J Otolaryngol 2002;31:131-6.
13. Becker DG. The minimally invasive, endoscopic approach to sinus surgery. J Long Term Eff Med Implants 2003;13:207-21.
14. Kabaalioğlu N, Uygur K, Yasan H, Kabaalioğlu A, Doğru H. The correlation between computed tomography findings of the paranasal sinuses and the symptoms of acute sinusitis. [Article in Turkish] Kulak Burun Bogaz Ihtis Derg 2003;11:39-45.