



Radiological Approach to Osteolytic Benign Calvarial Lesions

Osteolitik Benign Kalvarial Kitlelere Radyolojik Yaklaşım

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ABSTRACT

Histopathologically, calvarial lesions are congenital, inflammatory, neoplastic and traumatic origin and these are rarely seen. The calvarial lesions most commonly manifest as palpable mass on physical examination or they are diagnosed incidentally during a radiological test. Defect, lysis and sclerosis in the bony structure are evaluated with radiography and computed tomography (CT) and relationships of the lesions with the soft tissue components and surrounding soft tissue are evaluated with CT and magnetic resonance imaging (MRI) and especially with MRI. Based on the radiological findings, benign-malignant discrimination of the calvarial lesions can be made and it may be possible to estimate their histopathological diagnoses.

Key words: calvarial lesions; radiography; computed tomography; magnetic resonance imaging

ÖZET

Kalvarial lezyonlar histopatolojik olarak, kongenital, enflamatuar, neoplastik ve travmatik kökenli olup, nadir olarak izlenmektedir. Kalvarial lezyonlar en sık klinik muayenede ele gelen kitle şeklinde ya da radyolojik bir tetkikte insidental olarak tanı konur. Kemik yapıdaki defekt, lizis ve skleroz radyografi ve bilgisayarlı tomografi (BT) ile, lezyonların yumuşak doku komponentleri ve çevre yumuşak doku ile ilişkisi, BT ve manyetik rezonans görüntüleme (MRG) ile ve özellikle MRG ile değerlendirilir. Radyolojik değerlendirme sonucu, radyolojik bulgulara göre kalvarial lezyonların benign-malign ayrımı ve histopatolojik tanısını tahmin etmek mümkün olmaktadır.

Anahtar kelimeler: kalvarial lezyonlar; radyografi; bilgisayarlı tomografi; manyetik rezonans görüntüleme

Introduction

Calvarial bones are the structures that surround and protect the brain tissue together with the scalp. Parietal bone (PB), frontal bone (FB), occipital bone (OB), temporal bone (TB) and the great wing of the sphenoid bone (SB) form the calvarium. Calvarial bones consist of two cortical layers called inner and outer tabula and a bone marrow space between tabula called diploe space. Calvarial lesions form the osteolytic lesions by causing erosion and destruction in these layers. These lesions can be classified as structural, congenital, inflammatory, neoplastic and traumatic or primary and secondary or benign and malignant^{1,2}. If the lesion originates directly from calvarial bone, it is called as primary lesion. However if it originates from the adjacent structures and then affects the calvarial bones or if it is metastatic, it is called as secondary lesions. Benign lesions are well demarcated and have sclerotic contour, grow slowly. It causes erosion and defect on bony structure. However, malignant lesions have irregular contour and aggressive behavior. It causes destruction on the bony structure. Calvarial lesions are detected as palpable, painful or painless mass during physical examination. Radiographic evaluation is usually used as the first radiological method. Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) provides much more detailed information about the lesion^{2,3}.

In this paper it was aimed to present the radiological appearance of the Osteolytic Benign Calvarial Lesions (OBCL) which can be encountered during the daily radiological practice.

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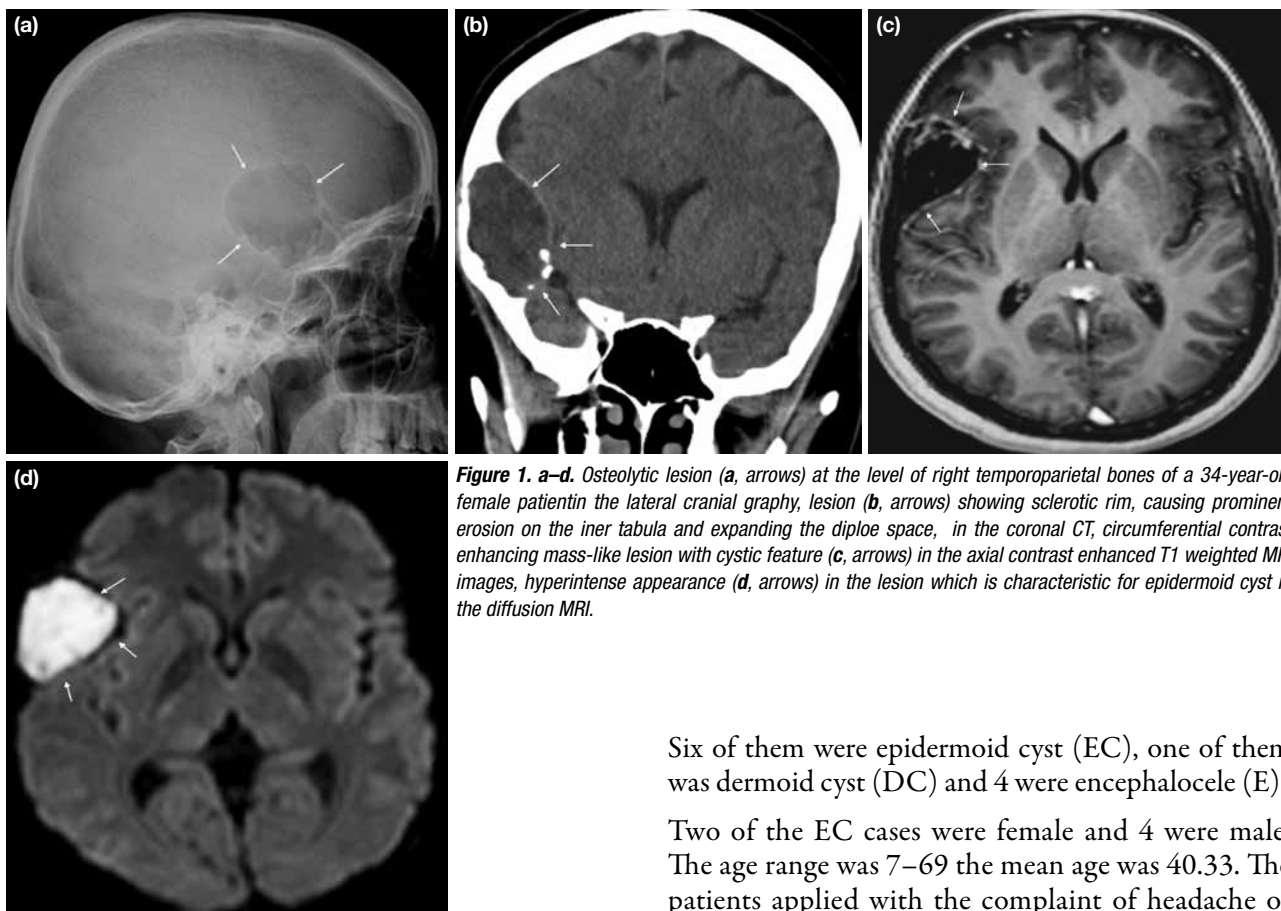


Figure 1. a–d. Osteolytic lesion (a, arrows) at the level of right temporoparietal bones of a 34-year-old female patient in the lateral cranial graphy, lesion (b, arrows) showing sclerotic rim, causing prominent erosion on the inner tabula and expanding the diploe space, in the coronal CT, circumferential contrast enhancing mass-like lesion with cystic feature (c, arrows) in the axial contrast enhanced T1 weighted MRI images, hyperintense appearance (d, arrows) in the lesion which is characteristic for epidermoid cyst in the diffusion MRI.

Material and Method

Radiographic, CT and MRI findings of 26 patients who came to the department of radiology with the diagnosis of calvarial mass or another diagnosis were evaluated in detail. The lytic and sclerotic pattern of the lesions were investigated with radiography and in addition to these, location, relationship with the adjacent structures, density and contrast enhancement of the lesions were investigated with 64-detector CT (Toshiba Aquilon 64 MDCT). The soft tissue component of the lesions, their relationship with the adjacent soft tissue and their contrast enhancement patterns were evaluated in detail with 1.5 Tesla MRI (Achieva, Philips, Best, The Netherlands).

Results

Eleven of the 26 osteolytic benign calvarial lesions which were diagnosed with radiological methods incidentally or applied to our clinic with the diagnosis of calvarial mass were detected to be of congenital origin.

Six of them were epidermoid cyst (EC), one of them was dermoid cyst (DC) and 4 were encephalocele (E).

Two of the EC cases were female and 4 were male. The age range was 7–69 the mean age was 40.33. The patients applied with the complaint of headache or calvarial mass. Three of the lesions were located on OB, the others were on FB, PB and TB. The maximum sized EC was located on OB and its size was 50x45x30 mm. In the radiographic evaluation of the lesions, they were observed to cause lytic areas on bony structure (Fig. 1a). All of the lesions were observed as lytic and expanding lesions in CT (Fig. 1b, 2e). EC were observed to have the cerebrospinal fluid (CSF) density and intensity (Fig. 1b–d, Fig. 2a–e). All of the ECs showed hyperintense signal pattern in the flair and

diffusion weighted sequences (Fig. 1d). Six cases were diagnosed during the preoperative radiological evaluation. Pathological result of all 6 cases was EC.

The lesion was located on the FB at the level of anterior fontanelle at the midline in a 20 year old male patient. Because of its regular contours, fat and fluid density within the lesion made us think of the diagnosis of DC and the postoperative pathological result was consistent with that diagnosis (Fig. 3a–c).

Defect on the bony structure in the patients who were between 0–17 years old, whose mean age was 8.5 were observed. Two of the patients were female

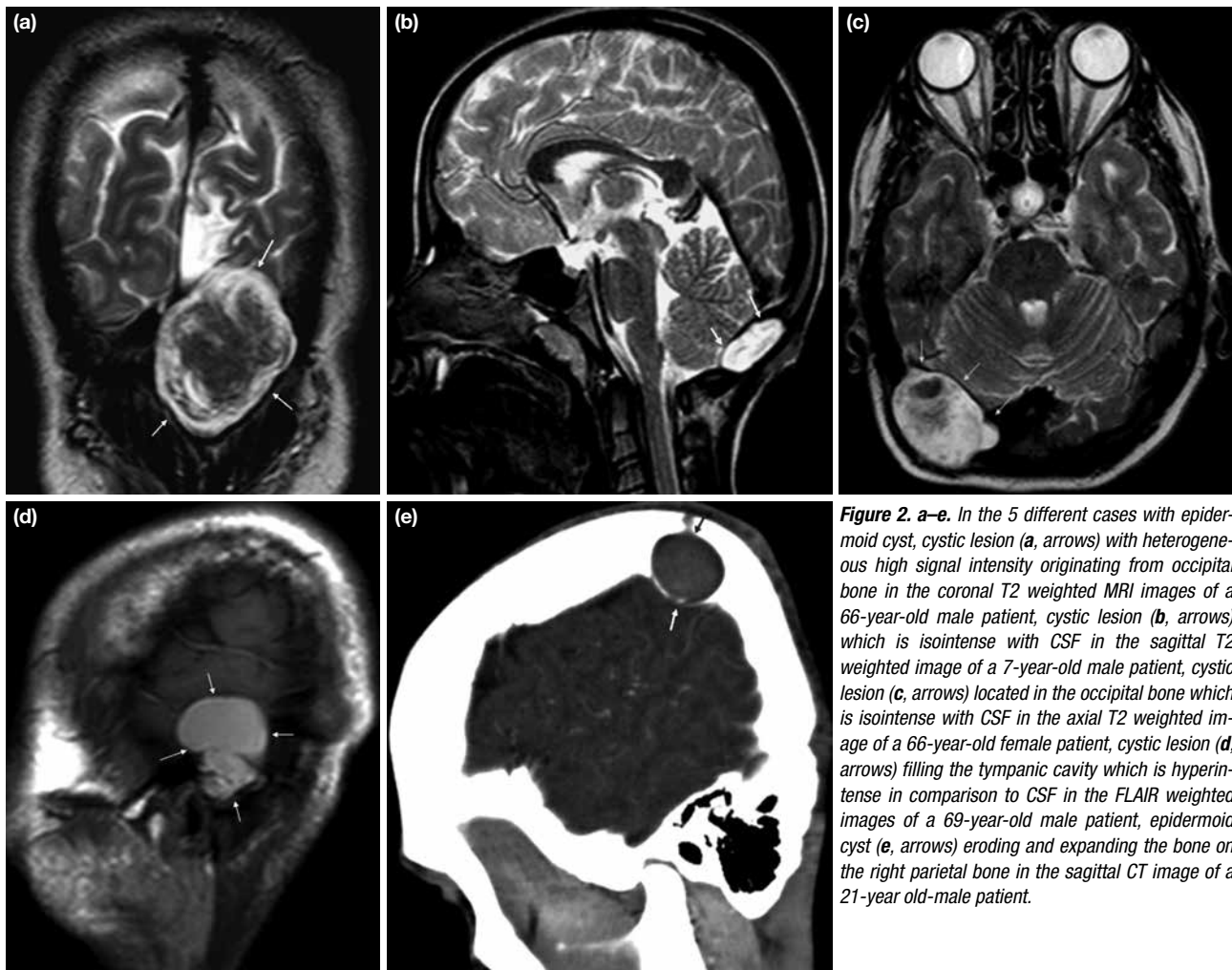


Figure 2. a–e. In the 5 different cases with epidermoid cyst, cystic lesion (a, arrows) with heterogeneous high signal intensity originating from occipital bone in the coronal T2 weighted MRI images of a 66-year-old male patient, cystic lesion (b, arrows) which is isointense with CSF in the sagittal T2 weighted image of a 7-year-old male patient, cystic lesion (c, arrows) located in the occipital bone which is isointense with CSF in the axial T2 weighted image of a 66-year-old female patient, cystic lesion (d, arrows) filling the tympanic cavity which is hyperintense in comparison to CSF in the FLAIR weighted images of a 69-year-old male patient, epidermoid cyst (e, arrows) eroding and expanding the bone on the right parietal bone in the sagittal CT image of a 21-year old-male patient.

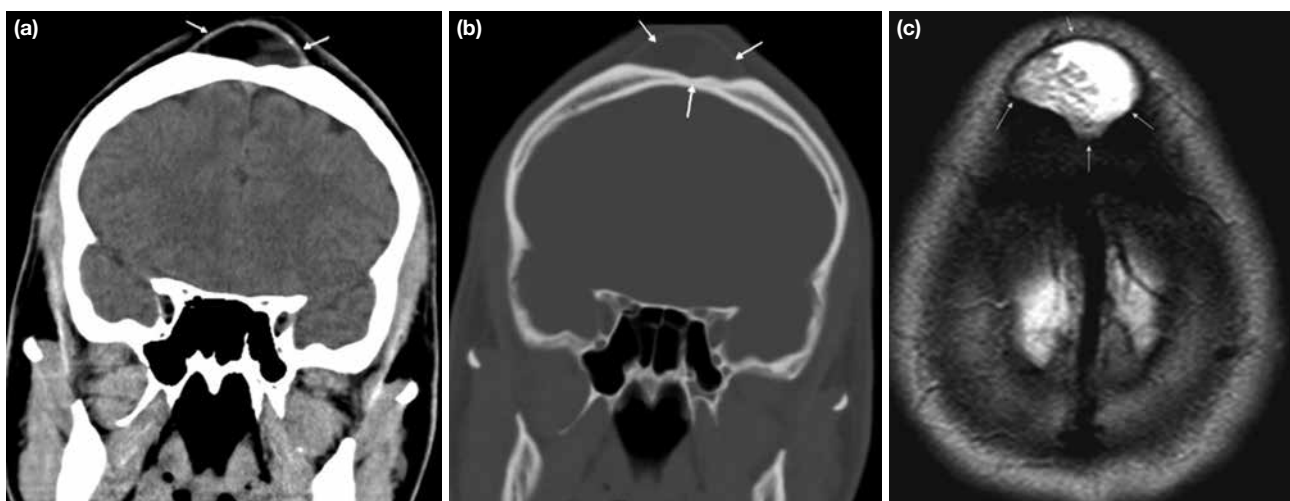


Figure 3. a–c. Cystic lesion (a, arrows) having fat and fluid densities inside typical to dermoid cyst causing prominent erosion on the frontal bone (b, arrows) in the parenchyma and bone window coronal plane CT images of a 20-year-old male patient, cystic lesions (c, arrows) having fat and fluid intensities inside in the T2 weighted axial MRI image.

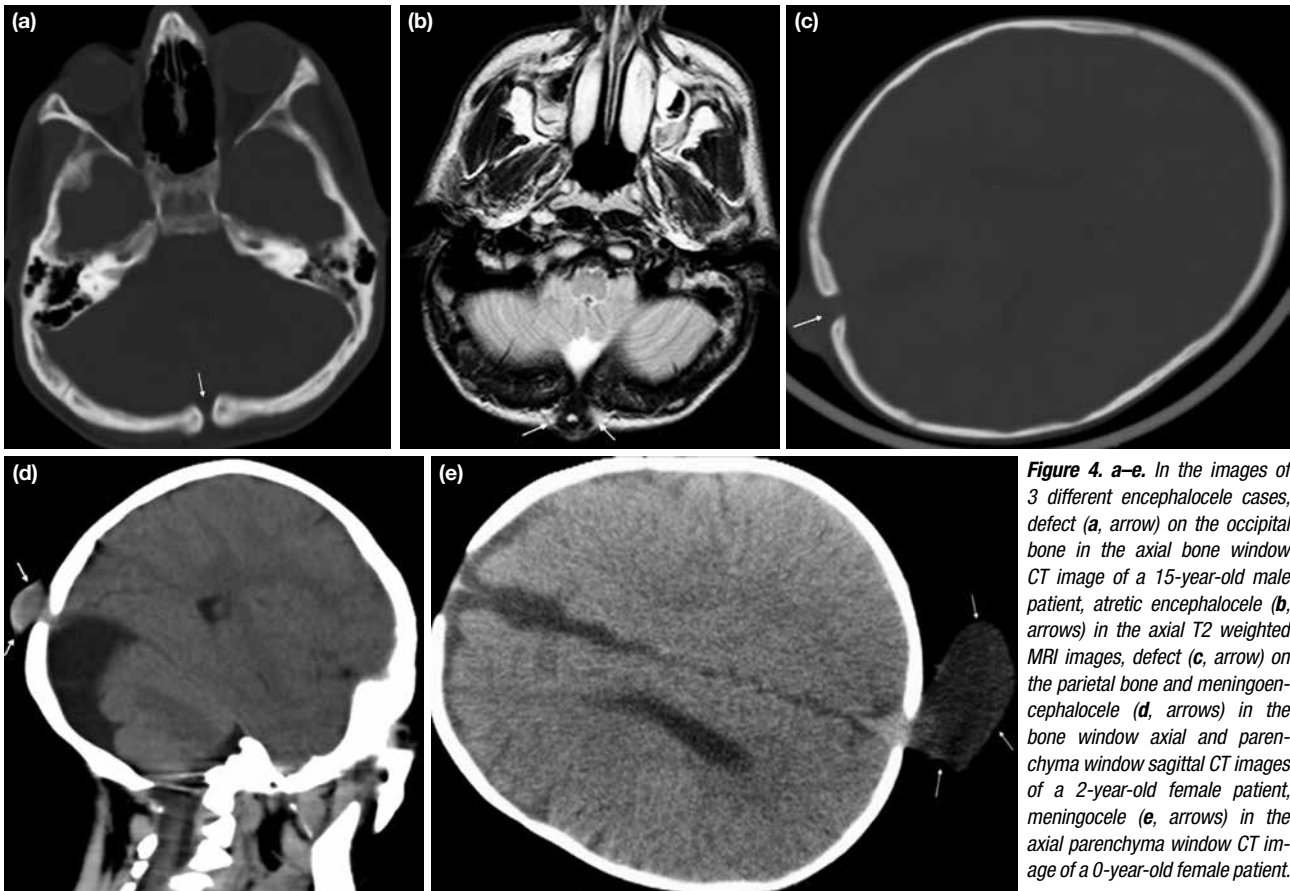


Figure 4. a–e. In the images of 3 different encephalocele cases, defect (a, arrow) on the occipital bone in the axial bone window CT image of a 15-year-old male patient, atretic encephalocele (b, arrows) in the axial T2 weighted MRI images, defect (c, arrow) on the parietal bone and meningoencephalocele (d, arrows) in the bone window axial and parenchyma window sagittal CT images of a 2-year-old female patient, meningocele (e, arrows) in the axial parenchyma window CT image of a 0-year-old female patient.

and had PB located lesion, 2 were male and had OB located lesion. Two male patients had the diagnosis of atretic encephalocele (AE) (Fig. 4a–d), meningoencephalocele (ME) (Fig. 4c–d) and 1 female patient had meningocele (M). Calvarial mass was detected clinically in all of the patients and in one patient involuntary movements were detected. 4 cases were diagnosed as E with radiological findings and their location on the bony structures was consistent with the literature.

Clinical findings, location of the lesions, radiological findings of all of the patients with the lesion of congenital origin were presented in Table 1.

The age range of the patients who were accepted as normal variant was 14–74, mean age was 57; 6 of them were female, 2 of them were male, they were diagnosed as arachnoid granulation (AG) due to their radiological appearances. The only clinical finding of these patients was headache. Five cases had OB, 2 cases had FB and 1 case had PB involvement. The number of the lesions

were more than one in the cases with OB involvement. Multiple lesions which were located on confluence of sinuses (CS) and the both transverse sinuses (TS) and caused prominent erosion on the inner tabula and diploë space, partial erosion on the outer tabula were observed and these lesions were very closely related with each other. The other 2 lesions causing erosion on OB was located in CS and right TS. The lesion with FB location was located in the superior sagittal sinus (SSS) on the left side of the midline, whereas the lesion with PB location was located in SSS on the midline. The lesion causing erosion on PB was observed as a non-contrast enhanced hypointense nodular lesion in SSS. The lesions in all cases were observed to cause prominent erosion on the adjacent bony structure in CT. These lesions had isointense signal pattern with CSF in T1 and T2 weighted sections of MRI and didn't show contrast enhancement.

The age range of the 6 patients with fibrous dysplasia (FD) who were accepted as neoplastic was 10 and 54

Table 1. Age, gender, clinical complaints of the patients, locations, radiological and pathological findings of congenital lesions

BENIGN OSTEOLYTIC SKULL LESIONS										
	No	Age	Gender	Clinical findings	Localization of the lesion and size	Radiographic findings	MDCT findings	MRI findings	Radiological diagnosis	Pathological diagnosis
Epidermoid -Dermoid Cyst	1	34	F	Headache Nausea	Frontal bone 43x33x24 mm	Lytic lesion	Lytic and expansile lesion in diploic space of frontal bone	T1 heterogeneous hypointens, T2 hyperintens, FLAIR and diffusion weighted sequence hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	2	69	F	Painful calvarial mass	Occipital bone 39x37x32 mm	Lytic lesion	Lytic and expansile lesion in diploic space	T1 hypointens, T2 hyperintens, FLAIR sequences hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	3	20	M	Headache	Left parietal bone 28x22x18 mm	Lytic lesion	Lytic and expansile lesion in diploic space	T1 hypointens, T2 hyperintens, FLAIR sequences hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	4	46	M	Headache Dizziness	Temporal bone 35x30x20 mm	Lytic lesion	Lytic and expansile lesion in diploic space	T1, T2 and FLAIR sequences hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	5	66	M	Painful calvarial mass	Occipital bone 50x45x30 mm	-	Lytic and expansile lesion in diploic space	T1, T2 and FLAIR sequences hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	6	7	M	Headache Occipital mass	Occipital bone	Normal	Lytic and expansile lesion in diploic space	T1, T2 and FLAIR sequences hyperintens, Rime enhancement with contrast	Epidermoid cyst	Epidermoid cyst
	7	20	M	Headache and mass	Frontal bone 43x32x23 mm	Lytic lesion	Lytic lesion, fluid and fat density in the cyst	Fluid and fat density in the cyst	Dermoid cyst	Dermoid cyst
Atretic Cephalocele	1	15	M	involuntary and mirror movement	Occipital bone 21x19x17 mm	Normal	Atretic cephalocele Occipital bone defect	Atretic cephalocele –Occipital bone defect Vertical position straight sinus	Oksipital AE	-
	2	0	F	Parietal bone Mass	Parietal bone	-	Meningocele Parietal bone defect,	Parietal bone, meningocele Vertical position straight sinus	Parietal AE	-
	3	17	M	Headache, Occipital bone mass	Occipital bone 11x9 mm	Normal	Atretic cephalocele Oksipital bone defect	Atretic cephalocele –Occipital bone defect Vertical position straight sinus	Oksipital AE	-
	4	2	F	Parietal bone Mass	Parietal bone 18x17x12 mm	-	Meningo-cephalocele Parietal bone defect	Vertical position straight sinus	Parietal AE	-

and the mean age was 29.8.2 were female, 4 were male and the clinical complaint was headache and calvarial mass. 5 cases had single calvarial bone involvement and 1 case had multiple calvarial bone involvements. OB involvement in 2 cases, PB in 2 cases and TB in 1 case were observed. The case with multiple involvements had FB, TB, EB, SB involvements. Due to the immature bony structure and fibrotic matrix, radiolucent, lytic and ground-glass appearances were observed in

radiography and CT of our cases. Heterogeneous hypointense appearance in T1 weighted sections, heterogeneous hyperintense appearance in T2 weighted sections were observed in MRI and the 3 cases who were given contrast material showed prominent contrast enhancement. These patients were diagnosed as FD because of their radiological appearances. Two cases had surgical intervention and the pathological result was consistent with FD.

Age, gender, clinical complaints of the patients and locations, radiological findings of their structural of normal variant and neoplastic lesions were shown in Table 2 in detail.

Lytic lesion was observed on his left PB having regular contours and being lobulated in the radiography and

CT of a 7 year old male patient. The soft tissue content and contrast enhancement of the lesion were observed in his MRI. The lesion was prediagnosed as eosinophilic granuloma (EG) when the age and radiological findings of the patients were considered. Postoperational pathology result was also EG.

Table 2. Age, gender, clinical complaints of the patients and locations, radiological pathological findings of normal variant and neoplastic lesions

		OSTEOLYTIC CALVARIAL LESIONS									
		No	Age	Gender	Clinical findings	Localization of the lesion	Radiographic findings	MDCT findings	MRI findings	Radiological diagnosis	Pathological diagnosis
HISTOPATHOLOGY	Neoplastic lesion	1	43	M	Headache, dizziness	Occipital bone	Radiolusent and mixed apparence	Ground-glass and mixed apparence	T1 hipointens, T2 heterogeneous. hiperintens andhipointensarea Contrast (+)	Fibrous dysplasia	Fibrous dysplasia
		2	17	F	Calvarial mass, Headache	Right parietal bone	Radiolusent bone mass	Ground-glass and mixed apparence	-	Fibrous dysplasia	-
		3	10	F	Calvarial mass, Headache	Frontal, temporal, sphenoid, ethmoidal bones	Radiolusent and mixed apparence	Ground-glass and mixed apparence	T1 hipointens, T2 heterogeneous hipointens, Contrast (+)	Fibrous dysplasia	-
		4	20	M	Calvarial mass,	Right parietal bone	Radiolusent and mixed apparence	Ground-glass and mixed apparence	-	Fibrous dysplasia	-
		5	35	M	Right heating reduction	Right temporal bone	Radiolusent and mixed apparence	Ground-glass and mixed apparence	T1 hipointens, T2 heterogeneous hipointens, Contrast (+)	Fibrous dysplasia	Fibrous dysplasia
		6	54	M	Headache	Occipital bone	-	Ground-glass and mixed apparence	-	Fibrous dysplasia	-
	Normal variant	1	65	F	Headache, dizziness 7. nerve palsy	Occipital bone	-	Multiple litic lesions in CS and bil. TS	T1 and T2 izointes with BOS. Contrast (-)	Arachnoid granulation	-
		2	74	M	Headache	Occipital bone	-	Multiple litic lesions in CS and bil. TS	-	Arachnoid granulation	-
		3	64	F	Headache	Occipital bone	-	Litic lesion in R-TS	T1 and T2 izointes with BOS.	Arachnoid granulation	-
		4	67	F	Headache	Occipital bone	-	One litic lesion in CS, two litic lesion in R-TS	T1 and T2 izointes with BOS.	Arachnoid granulation	-
5		62	F	Headache	Occipital bone	-	One litic lesion in CS, two litic lesion in R-TS	T1 and T2 izointes with BOS.	Arachnoid granulation	-	
6		61	F	Headache	Frontal bone	-	One litic lesion in SSS	T1 and T2 izointes with BOS. Contrast (-)	Arachnoid granulation	-	
7		14	M	Headache	Frontal bone	-	One litic lesion in SSS	T1 and T2 izointes with BOS.	Arachnoid granulation	-	
8		49	F	Headache	Occipital bone	-	Multiple litic lesions in CS and bil. TS	T1 and T2 izointes with BOS.	Arachnoid granulation	-	

Abreviations; CS, confluens sinuum, TS, transvers sinus, SSS, superior sagital sinus, R, right

Discussion

CBOL has a broad histopathological spectrum and it is encountered very commonly during our daily practice. To narrow the diagnostic spectrum radiological evaluation seems very useful. We can classify these lesions in 5 groups as normal variant, congenital lesions, benign neoplastic, inflammatory and traumatic lesions. ECs, DCs, Es, sinus pericranii are congenital, venous pooling and AG are normal variant calvarial lesion. FD, lipoma and osseous hemangioma are primary calvarial neoplastic lesions with benign character. EG is inflammatory and leptomeningeal cyst is traumatic calvarial lesions. They are evaluated with their erosion, defect and sclerosis causing features, their unique density and intensities and contrast enhancement feature in the radiological examination and their soft tissue components and relationships with the surrounding tissues are evaluated with CT and MRI. Dural involvement is observed in malignant lesions, whereas it is not observed in benign lesions. Due to the malignancy risk of calvarial lesions preoperative radiological evaluation must be made. Radiography and CT are the preferred imaging methods. MRI is superior to them in terms of detecting the lesion during early stage when it is limited in the diploe space in bone marrow as well as determining the soft tissue components of the lesion and its relationship with the adjacent soft tissue. To make the diagnosis of benign lesion is important during the preoperative period. Simple craniectomy is sufficient for the benign calvarial lesions^{2,4}.

ECs and DCs which are congenital CBOL are not real tumoral lesions, but known as congenital inclusion cysts of ectodermal origin. They develop as a result of the inclusion of ectodermal cells at the intradiploic space during the neural tube closure between intrauterine 3rd–5th weeks⁵. EC contains single type of tissue like epidermoid elements, whereas DCs are inclusion cysts containing different type of tissues such as sebaceous and sweat glands, hair follicles. ECs are observed more commonly on PB and TB in the patients aged between 20 and 50, whereas DCs are observed on locations close to sutures most commonly on the anterior fontanelle in the newborn patients and patients aged older than 3^{5,8}. ECs comprise 1% of the all intracranial tumors. It is observed 90% in intradural region on any part along the neural axis, most commonly in cerebellopontine angle (40%). 10% of the cases are located in extradural region, most commonly on the intradiploic sides of the calvarial bones. While there was no gender difference

in ECs, DCs are observed more commonly in women. Headache and calvarial mass are the main clinical findings in both lesions. Radiological differential diagnosis is made according to the location and content of the cyst and its relationship with the surrounding structures. ECs with intradiploic location form scalloping after causing expansion and erosion at the bony structure. Sclerotic rim usually develops around it. These radiologically described findings are observed as lytic areas. While ECs are seen as lesions with CSF density and intensity, DCs are observed as lesions with fat density due to its fat content in CT and with heterogenous signal intensity in MRI and their fat content is observed as hyperintense regions in T1 weighted sections. The most important differential diagnosis of ECs is their hyperintense signal pattern in FLAIR and diffusion weighted sequences. Both of the cysts grow slowly, their malignant transformation is very rarely seen and surgery is the preferred treatment^{2,4,9–11}. ECs are observed on OB in 3 of our cases which is not consistent with the literature, since it was reported in the literature that PB and TB are the most frequent bones involved. The mean age of our cases was 40.33 and this is consistent with the literature 1 of our cases had the diagnosis of DC and its location and radiological characteristics are consistent with the literature.

Encephalocele is a fusion defect in the bone and the herniation of intracranial structures from this defect. It is classified as M, ME, AE and gliocoele (G) according to its neural element content. AE contains dura mater, degenerative fibrous and neural tissue. The most common cephalocele is the occipital cephalocele arising from the defect at the OB. Parietal, temporal, frontal etc. ECs are also observed. Radiography and CT are utilized to show the bone defect, MRI is used to show the sac, its content and the concomitant cerebral abnormalities. It might be observed together with some cerebral pathology such as cortical dysplasia, venous sinus abnormalities, corpus callosum abnormalities, Dandy-Walker and Chiarimal formation^{4,12}. Four of our 2 cases were at the OB, 2 were at the PB. 2 cases were female, 2 were male and since they were not operated 2 were evaluated as AE, 1 as M and 1 as ME. Clinical finding were calvarial mass in all our patients and involuntary movements in 1 patient.

Arachnoid granulation if formed by the extension of the arachnoid membrane towards inside the dural sinuses. They are generally located in the sagittal sinus. They are rarely located within the transverse and

sigmoid sinus. They usually have 2–8 mm size within the dural venous sinus. Sometimes they fill the venous sinus by growing in time, as well as extend until the inner tabula, diploe space and outer tabula by causing erosion on the bone. They are detected incidentally in CT and MRI scans and usually asymptomatic. They might present with headache by causing partial sinus thrombosis and venous hypertension after filling the dural sinuses. They are in the form of erosive lytic lesion with regular contours inside the calvarial bone in radiography. They are observed as lesions with CSF signal intensity causing erosion on the adjacent bony structure in MRI and lesions with CSF density that show close proximity to dural sinuses in CT. Sometimes hypointense areas related with fibrotic septa are observed in MRI. Multiple myeloma, metastatic lesions, EC, DC and AC should be taken into consideration for differential diagnosis^{13–18}. The complaints of all patients were headache. All the diagnoses were made by radiological examination and since surgery was unnecessary due to the absence of any clinical finding that may necessitate the surgery. All the patient were followed. AG was present on OB, confluenssineum and transvers dural sinus in 5 cases. Since SSS was reported as the most frequent region, the involved areas were not consistent with the literature.

Fibrous dysplasia are benign neoplastic bone pathologies in which the immature bone and fibrous stroma take the place of normal medullary bone as a result of abnormal differentiation of the osteoblasts. Monocytotic, polycytotic, McCune Albright syndrome are the types of FD. Men and women are affected equally. FD is observed mostly between 3–15 and most of the patients are diagnosed before 30. It comprises 2.5% of the benign all bone tumors and 5–7% of the benign bone tumors. It is observed on head and neck region in 25% of the cases. It is located mostly on maxillary and mandibular bones in craniofacial region; FB, SB, EB are the most common and TB, OB are the least common location of involvement. There might be no clinical finding in FD other than swelling and asymmetry on the chronically involved bone. Findings such as blindness, deafness, headache secondary to compression on the adjacent structure and obstruction as a result of enlargement and expansion of the lesion in time might be observed. Malignant transformation can be observed in the polystatic type of patients who are having radiotherapy. Radiological findings in FD change according to the ratio of bone and fibrous matrix of the lesion and cystic change, hemorrhage and cartilaginous tissue

content of the lesion. Even though the radiological findings give sufficient information for diagnosis, they are not characteristic. Biopsy and pathological investigation after surgery might be required. CT is the best imaging modality, but MRI, radiography and scintigraphy are the other diagnostic imaging modalities. The most common appearance in CT and radiography is the ground-glass appearance due to the histopathological characteristics of the lesion on the bony structure. While the regions with high fibrous tissue and cystic area content are radiolucent, the regions with high osseous tissue content are sclerotic. FD is observed as a hypointense halo with regular borders which is attached to the sclerotic border in all sequences of MRI. MRI is the imaging modality of choice to show the interior structure of the lesion and its relationship with the surrounding structures. Surgical treatment is preferred in symptomatic patients to relieve the cranial nerve compression and also for cosmetic reasons^{19,20}. Two of the 6 patients who were radiologically diagnosed as FD had surgery and the pathological result was FD. The lesion was located on 1 bone in 5 cases and the lesions were located on multiple calvarial bones in 1 case. Clinically there were headache and calvarial mass in all cases.

Eosinophilic granuloma is a disease from Langerhans Cell Histiocytosis group. Langerhans Cell Histiocytosis (LCH) is a disease that develops after the abnormal proliferation of the histiocyte and has an unknown etiology. Observing the Langerhans cells is typical for the disease. EG is the local benign form of LCH disease. Malignant transformation is not observed. Usually one or sometimes more than one lytic lesions are observed on the head bones^{11,12}. The frequency among bone tumors are 1%. 90% of them are observed before 10 year old and usually in boys. Clinical diagnosis is usually made after palpating the calvarial mass on the parietal region. Sometimes there might be headache and pain on the mass. Radiography, CT and MRI are used in the diagnosis. EG is usually in the form of oval lytic lesion which has regular contour and doesn't show circumferential sclerosis. Radiography and especially CT shows the lytic lesion easily. The soft tissue component of the lesion is shown in detail with MRI. It is observed hypointense in T1 weighted sequences, hyperintense in T2 sequences and isointense with the muscular tissue. It has prominent contrast enhancement in MRI^{11,21,22}. If the patient has no complaint, follow-up without treatment is suggested. If the patient has any complaint, the lesion is curetted and excised surgically. Chemotherapy and radiotherapy can be used for the multiple lesions

of EG. Lesion located on the PB of 1 patient was evaluated as EG. Since the possible malignancy couldn't be excluded, the patient was operated and the pathological result was EG.

CBOL show a broad histopathological spectrum. In our study, we evaluated the lesions which are rarely seen during the daily radiology practice. We didn't include the cases secondary to trauma and surgery which are very commonly seen. Radiological findings are consistent with the histopathological diagnosis in most cases, they can make differentiation between benign and malignant and they affect the treatment protocol significantly.

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