



## Acute Hematogenous Osteomyelitis of the Patella in a 6 Years Old Child: A Case Report

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### Abstract

Acute hematogenous osteomyelitis of the patella is a rare entity in the children and is often associated with delayed diagnosis due to the variable and non-specific presentation. Advanced imaging like bone scintigraphy, MRI and CT scan is often required to diagnose the condition. Arthrotomy, debridement and curettage of the dead and necrotic material followed by antibiotics for 4-6 weeks are the mainstays of the treatment.

We present a case of a 6 years old female child with acute hematogenous osteomyelitis of the patella.

**Keywords:** Osteomyelitis; Patella; Lytic Lesion

### Introduction

As compared to the long bones, osteomyelitis of the patella is a rare entity [1,2]. The peak incidence is seen between the age of 5-15 years [3]. It is most commonly seen secondary to the hematogenous spread. It may be associated with the history of trauma, systemic infection, and immunosuppressive state [4]. Delayed diagnosis is often encountered due to rarity as well as the inconclusive findings like a sterile joint aspiration. X-rays are inconclusive as patella ossification is in process. Septic arthritis was found to be more common in the children below the age of 2 years. However, in the older age group, it was associated with osteomyelitis more frequently [5]. Therefore osteomyelitis needs to be ruled out in children more than 2 years of age with the presence of septic arthritis.

We report a case of isolated patella osteomyelitis in a 6 years old female child.

### Case Presentation

A 6 years old female child with the history of fall 20 days back followed by swelling in the left knee, fever and painful knee movements, was admitted in our institute in May 2018. She took

the initial treatment somewhere else in the form of aspiration (no reports available) and knee immobilization with the slab but there was no improvement. On clinical examination of the left knee, positive findings were swelling, the rise of local temperature, generalized tenderness around the knee and painful restricted movements.

X-ray was suggestive of joint effusion. ESR and CRP were raised to 60 and 86 respectively. In view of septic arthritis, blood culture was sent and IV antibiotics started empirically. MRI was done to rule out osteomyelitis and to know the involvement of the bone.

On MRI, a well-defined multi-lobulated lytic destructive lesion involving the central part of the patella with the internal loose body was seen. Also, mild knee joint effusion was noted with the mild diffuse thickening of the synovium of joint. It appeared hypointense on T1w images, hyperintense on T2w and fat sat images. (Figure 1-3) Post contrast study showed minimal peripheral enhancement of the lesion. Diffuse homogeneous enhancement of the synovium was also noted. It was likely suggestive of infective etiology with synovitis.

The patient was referred to the Dept. of Orthopaedic surgery and was posted for the Debridement and Curettage.



Figure 1



Figure 2



Figure 3

**Intra Op findings**

There was no frank purulent discharge. Synovium was thickened and congested. Patella had a defect of approximately 3 x 2 cms in the lower half on the articular side with granulation tissue inside (Figure 4) Curettage of the lytic lesion was done. wash was given. Samples were sent for AFB, GRAM stain, culture sensitivity, and gene expert. The negative suction drain kept inside along with immobilization with the plaster.



Figure 4

Postoperatively, as per the culture and the sensitivity, Inj. Vancomycin [40 mg/kg/day divided every 6 hours] was given for 7 days and oral linezolid [10 mg/kg/dose, three times a day ]was given for the next 5 weeks. At one month, CBC, CRP, and ESR were done and all the parameters were within normal limits. On clinical examination of the left knee joint, swelling and mild warmth were present but no effusion. The scar healed by primary intention. Left knee ROM was painless and 0-90 ° as compared to 0-140° in the right knee (Figure 5). The patient had advised a knee range of motion exercises and was called again on follow up at 6 months.



Figure 5

At 6 months, there was no swelling, warmth, tenderness, and effusion in the left knee. ROM was painless 0-140 ° on both sides (Figure 6). The patient was walking normally without the support and was able to perform all the activities of daily life. On X-rays of the Left knee AP and Lateral views, there was no patella fracture and ossification in the lower part of the patella was visible (Figure 7).



Figure 6



Figure 7

**Discussion**

Acute hematogenous osteomyelitis most commonly involves the long bone while the involvement of the patella is rare [2,6]. The peak incidence is seen between the age of 5-15 years [3]. In Initial 4-5 years of age, the patella is cartilaginous with less vascularisation. As it starts to ossify after the 4-5 years of age, vascularisation also develops. Vascularisation reaches to peak around the 12 years of age and begins to diminish as ossification completes around 15-16 years of age. This explains the peak incidence of the patella osteomyelitis between the 5-15 years of the age group [7]. Though the patella has the extensive blood supply from the anastomosis of superior, inferior geniculate and the anterior tibial recurrent arteries, it lacks the physal plate and the HAIRPIN like loops of the vessels. Hence, it is not associated with the typical sluggish blood flow as seen in the metaphyseal region of the long bones. This explains the rare involvement of the patella in the acute hematogenous spread [1,8]. Also, the thick cartilage in children is resistant to the infection. And, the infection remains limited to the patella before progressing to the septic

arthritis of the knee joint. Hence, the initial synovial reaction leads to the sterile knee effusions which create more dilemmas in the diagnosis [9]. Patella osteomyelitis may mimic as septic arthritis, synovitis, septic bursitis, and peri-patellar cellulitis/bursitis which delays the diagnosis further [3].

The most common mode of transmission being hematogenous spread [2]. And the most common organism for the pyogenic infection in the children is the *Staphylococcus Aureus*. Though the *S. Aureus* is most commonly involved in the acute hematogenous osteomyelitis, *Streptococcus*, *E. coli*, *Clostridium* spp has also been reported as the pathogens [10].

X-rays do not provide much information in such cases and delay the diagnosis. Even aspirates come negative as most of the time it is reactionary like our case. Hence, the early advanced imaging with bone scintigraphy, CT, and gadolinium-enhanced MRI has been recommended in children with a high suspicion index. MRI is superior to the scintigraphy and locates the lesion precisely. Also, it tells about the involvement of the joint [2].

Surgical treatment is necessary when there is no improvement in the symptoms over a period of 24-48 hours of I.V antibiotics. Arthrotomy is required to remove purulent material and curettage of the dead and necrotic bone is required like our case [7]. The overall period of the antibiotics should be around 4-6 weeks as per the sensitivity report [10].

We reviewed the literature for the patella osteomyelitis in children and found a few cases similar to ours.

S. no	Author	Age	History of injury	Imaging	Management	Organism involved/ Histopathology	Antibiotics and duration
1	Hoe Jeong Chung, et al. [7]	6yrs	present	MRI	Debridement and Curettage	MRSA	I.V Vancomycin 2weeks
2	Matthias Sperl, et al. [11]	10yrs	present	MRI	Debridement and Curettage and Antibiotic beads (gentamycin)	<i>Staph. Aureus</i>	I.V Cefuroxime and I.V fosfomycin for 12 days f/b oral amoxicillin with clavulanic acid for 16 days
3	Antoine DE GHELDERE, et al. [12]	10yrs	Present	CT	Bone needle biopsy	<i>Staph. Aureus</i>	I.V Rifampicin and I.V cloxacillin for 10 days f/b oral clindamycin and rifampicin for 6 wks
4	Jorge Gil-Albarova, et al. [2]	8yrs	Absent	Bone scintigraphy and MRI	Debridement and Curettage	<i>Staph. Aureus</i>	I.V Cefotaxime and I.V cloxacillin for 10 days f/b oral cloxacillin for 2 weeks
5	R Sivakumar, et al. [9]	8yrs	thorn prick	MRI	Debridement and Curettage	Nonspecific synovitis	I.V Amoxicillin with clavulanic acid and I.V metronidazole for 10days f/b oral Amoxicillin with clavulanic acid for 4 Wks
6	Samara J, et al. [13]	14 months	Absent	MRI	Joint Aspiration	<i>Kingella kingae</i>	I.V Cefuroxime for 3 days f/b oral cefuroxime for 3 Wks
		6yrs	Absent	MRI	Debridement and Curettage	<i>Kingella kingae</i>	I.V Amoxicillin 3 days f/b oral amoxicillin for 3 Wks

Table 1

In the review of the above-mentioned cases, we found the patella osteomyelitis in the age group of 14 months to 10 years. Few had a preceding history of an injury like our case and others were not. The majority of the cases required advanced imaging like MRI as in our case and few did CT scan and bone scintigraphy. The majority of the cases were managed surgically with the debridement and curettage like ours. The most commonly found organism was *Staph. Aureus*. Others reported MRSA and Kingell Kinage too. There was no common consensus regarding the duration of the antibiotics but the minimum period was 2 weeks and the maximum was up to the 6 weeks like our case.

In conclusion, the acute hematogenous osteomyelitis of the patella in children is a rare entity and it leads to the delay in the diagnosis. We may get inconclusive findings like the absence of purulent synovial fluid and negative synovial fluid culture on initial tapping. In the cases with high suspicion of septic arthritis with the swollen, warm knee with painful and decreased ROM and raised acute phase reactants, further evaluation with the advanced imaging options like MRI, Bone scintigraphy and CT scan is valuable. It should be managed with joint debridement and curettage unless there is an improvement in the clinical sign and the symptoms on IV antibiotics. Antibiotics should be started as per the culture and sensitivity report for a minimum period of 4-6 weeks.

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