

## Knee cap bursitis/housemaid's Knee role of magnetic resonance imaging: A case report

Amandeep Singh<sup>1</sup>, Aaina Devgan<sup>2</sup>, Sumanjeet Kaur<sup>3</sup>, Prabhjot Singh<sup>3</sup>

From <sup>1</sup>Professor, <sup>2</sup>Senior Resident, <sup>3</sup>Resident, Department of Radiodiagnosis and Imaging, SGRD Institute of Medical Sciences and Research, Sri Amritsar, Punjab, India

### ABSTRACT

Pre-patellar bursitis is one of the major causes of anterior knee pain affecting people between 40 and 60 years of age. It occurs secondary to trauma, infection, overuse, systemic illness, and inflammatory arthropathy. Bursitis can be associated with certain occupations and named accordingly such as pre-patellar bursitis is also known as housemaid knee. Here, we present the case of a 65-year-old female who presented with a visible palpable swelling in the pre-patellar region for 6–7 months which was gradual in onset. Magnetic resonance imaging (MRI) reveals well-defined collection in the pre-patellar bursa along with mild joint effusion. MRI is the modality of choice in this case as it shows high signal intensity on T2 W images and low signal intensity on T1-weighted images. Heterogeneity of the signal is altered when hemorrhage, thickened inflamed synovium, calcification, or loose bodies.

**Key words:** Bursitis, Magnetic resonance imaging, Pre-patellar, Knee cap

A bursa is a fluid-filled structure that lies between the skin and tendon or tendon and bone. Its main function is to minimize friction between the adjacent moving structures [1]. They are classified according to their location as subcutaneous, subfascial, subtendinous, and submucosal [2]. Bursae can be divided into two types, anatomic and adventitial. Anatomic bursae are the true synovial lined sacs that are fluid filled and are located near the joint. In contrast, adventitial bursae are not synovial lined and may occur away from the joint [3]. Bursae around the patella include the pre-patellar bursa, the superficial and deep infrapatellar bursae, and the suprapatellar bursa [1]. Inflammation of this fluid-filled structure is called bursitis. Various causes of bursitis can be trauma, infection, overuse, systemic illness such as collagen vascular disease, and inflammatory arthropathy. Some cases of bursitis are associated with certain occupations and are named accordingly; for instance, pre-patellar bursitis is also known as housemaid's knee and superficial infrapatellar bursitis is synonymous with clergyman's knee [1].

### CASE REPORT

A 65-year-old female patient presented with a visible palpable swelling in the pre-patellar region for 6–7 months. The patient

also had intermittent anterior knee pain of moderate intensity which is associated with difficulty in walking for 5 months.

On examination, the patient was having a body mass index of 28 kg/m<sup>2</sup> with a weight of 72 kg and height of 160 cm. The patient was afebrile, normotensive with a pulse rate of 72 bpm. On local examination, the swelling was approximately 10×4 cm in size and was gradual in onset. There was a limited range of movement at the knee joint which was more evident as the swelling increased in size.

Magnetic resonance imaging (MRI) revealed well-defined collection in the pre-patellar bursa along with mild joint effusion. However, the signal intensity of Hoffa's fat pad was maintained (Fig. 1). Pre-patellar bursitis was also accompanied by reduced bulk and reduced slope of the anterior cruciate ligament (ACL) suggestive of chronic ACL injury. Degenerative changes were noted in the form of marginal osteophytes and thinning and erosions of articular cartilage (Fig. 2).


Local injection of nonsteroidal anti-inflammatory drugs was given to the patient which was followed by incision and drainage of the collection. After that, the pain was markedly relieved. The patient was advised to avoid activities that worsen the symptoms. In case of recurrence, a bursectomy was advised to the patient.

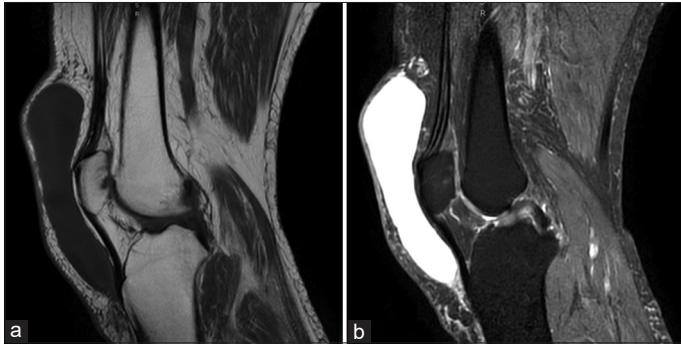
### DISCUSSION

Bursae are usually not visible on imaging unless they are irritated or inflamed secondary to trauma, infection, or arthritis. In general,

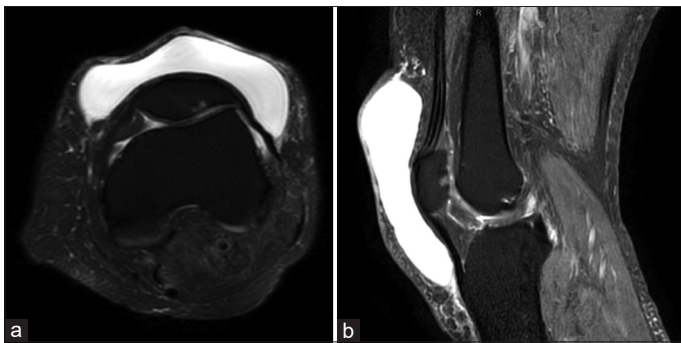
**Correspondence to:** Amandeep Singh, 469, East Mohan Nagar, Sultanwind Road, Amritsar - 143 001, Punjab, India. E-mail: dr.amancs@gmail.com

© 2021 Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC-ND 4.0).

| Access this article online   |  |
|--|--|
| Received - 09 February 2021<br>Initial Review - 25 February 2021<br>Accepted - 12 March 2021 | Quick Response code<br> |
| DOI: 10.32677/IJCR.2021.v07.i03.009  |  |



**Figure 1:** Sagittal section of the (a) T1-weighted image and (b) proton density-weighted image of the left knee of the patient with anterior knee pain showing smooth well-defined collection which appears hypointense in the pre-patellar region – suggestive of pre-patellar bursitis. Note the normal signal intensity of Hoffa's fat pad



**Figure 2:** (a and b) Axial and sagittal section of the proton density-weighted image of the left knee of the same patient showing thinning and erosion of articular cartilage is seen along the posterior aspect of patella with underlying subchondral marrow changes. There was reduced bulk of anterior cruciate ligament with reduced slope well visualized on sagittal section

bursae do not connect to the joint space, which distinguishes them from synovial cysts and normal joint recesses [4].

The pre-patellar bursa is located anterior to the patella, between the patella and patellar tendon and the overlying skin [5]. Pre-patellar bursa is a complex of three separate bursae, intercalated between a trilaminar arrangement of fibrous tissues. The subcutaneous bursa lies between the skin and the superficial fascia, a thin delicate fibrous structure with transversely oriented fibers continuous with the fascia lata proximally and the crural fascia distally. The normal pre-patellar bursae are small structures centered over the patella, although they may project beyond its lateral border by a few millimeters [6].

Bursitis can sometimes clinically be misdiagnosed as joint-, tendon- or muscle-related pain. Pathological processes are often a result of inflammation [2]. Chronic trauma in the form of prolonged or repeated kneeling leads to inflammation and hemorrhagic bursitis. It results from the bursa undergoing repetitive compressive and shear forces between the skin and the patella due to the positioning the individual's weight on to the anterior knee over the patella [3].

Imaging studies enable the diagnosis of cystic lesions of the knee. The ultrasound is used in case of palpable masses, in addition, it helps differentiate between cystic lesion and solid

lesion. It is inexpensive and generally speaking, it is an available resource. Computerized tomography is limited in the evaluation of cystic lesions. MRI is comparatively more functional study of choice, in many cases, these lesions are found incidentally [7]. Anterior and posterior bursae are better demonstrated on sagittal and axial images while medial and lateral bursae are better demonstrated on coronal and axial images [5].

MRI is an excellent method for demonstrating and differentiating these lesions. It is essential to identify typical MRI patterns that contribute to establish the correct diagnosis and therefore guiding specific therapy helps in avoiding unwarranted interventional procedures such as biopsy or arthroscopy [8]. The serous content within the bursa decides its signal intensity. The fluid has high signal intensity on T2 W images and low signal intensity on T1-weighted (T1W) images. Heterogeneity of the signal is altered when hemorrhage, thickened inflamed synovium, calcification, or loose bodies complicate the procedure [5]. Chronic overuse can lead to bursal wall thickening, superficial fibrosis, and fascial thickening rather than bursal fluid accumulation. Chronic bursitis sometimes results in dramatic bursal enlargement, producing a large mass that extends well beyond the patellar borders, associated with wall thickening, loculation, and internal debris. This appearance is difficult to distinguish from bursal infection, as both can contain heterogeneous debris and have thickened walls that enhance after contrast material administration [8]. Similarly, in our study, there is a smooth well-defined fluid-filled structure in the pre-patellar location following fluid signal intensity which appears hypointense on T1W images and hyperintense on proton density-weighted images. It measures approximately 13.4×5.2×5 cm in size. The signal of the fluid appears homogeneous as the bursa is not complicated by hemorrhage, septations, or debris. Remember that not everything that is bright on a T2W-image is fluid. Suspicion arises if there is something that looks like a fluid collection but not at an appropriate location, where there normally is a bursa, cyst, or recess. So Gadolinium enhanced images are used to differentiate between solid and cystic lesions [9].

Familiarity with the normal anatomy, pathology, and imaging characteristics of bursae is important as bursitis can mimic pain related to joints, periarticular tendons, and muscles. Gram staining must be performed to obtain the correct diagnosis, and the aspirated bursal synovial fluid must be cultured if septic bursitis is suspected [10]. Distinguishing bursitis from other causes of joint, periarticular tendon, and muscle pain will direct the clinician toward focused management [2].

## CONCLUSION

Pre-patellar bursitis is the inflammation along with fluid collection in the pre-patellar bursa. It is also termed as housemaid's knee. MRI is the most sensitive imaging modality. It can describe the homogeneity of the fluid. There is an additional advantage of the gradient echo sequence which can differentiate simple fluid from the complex hemorrhagic fluid. In unstable patients who cannot

undergo MRI examination, ultrasound can also act as a valuable tool in the evaluation of these patients. However, its sensitivity is low as compared to MRI.

## REFERENCES

1. Chatra P. Bursae around the knee joints. *Indian J Radiol Imaging* 2012;22:27-30.
2. Hirji Z, Hunjun JS, Choudur NH. Imaging of the bursae. *J Clin Imaging Sci* 2011;1:22.
3. Chhabra A, Cerniglia AC. Bursae, cysts and cyst-like lesions about the knee. *J Am Osteopath Coll Radiol* 2013;2:2-14.
4. Wu J, Eisenberg R, Telischak N. Cysts and cystic-appearing lesions of the knee: A pictorial essay. *Indian J Radiol Imaging* 2014;24:182-91.
5. Papadopoulou P, Kalaitzoglou I, Michailidis N, Tsifoundoudis I, Psychidis-Papakirytsis P, Koutsourlis A, *et al.* MRI of distended bursa around the knee. *Eur Soc Radiol* 2010. Doi: 10.1594/ecr2010/C-2240.
6. Flores DV, Mejía Gómez C, Pathria MN. Layered approach to the anterior knee: Normal anatomy and disorders associated with anterior knee pain. *Radiographics* 2018;38:2069-101.
7. Estrada M, Royero M, Arismendy D, Alzate JB. Cystic lesions of the knee. Pictorial review. *Rev Colomb Radiol* 2015;26:4121-32.
8. Perdikakis E, Skiadas V. MRI characteristics of cysts and “cyst-like” lesions in and around the knee: What the radiologist needs to know. *Insights Imaging* 2013;4:257-72.
9. Rubin D, Smithuis R. Non-menisal Pathology. *Radiology Assistant*; 2005. Available from: <https://www.radiologyassistant.nl/musculoskeletal/knee/non-menisal-pathology>. [Last accessed on 2020 Nov 12].
10. Sato M, Watari T. Housemaid's knee (prepatellar septic bursitis). *Cureus* 2020;12:e10398.

*Funding: None; Conflicts of Interest: None Stated.*

**How to cite this article:** Singh A, Devgan A, Kaur S, Singh P. Knee cap bursitis/housemaid's knee role of magnetic resonance imaging: A case report. *Indian J Case Reports*. 2021;7(3):102-104.