

# The Presence of Brucella in a Baker Cyst, a Case Report in Jeddah, Saudi Arabia– A Case Report

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## Learning Point of the Article:

1. Given that this is one of the rarer presentations associated with brucellosis, it is crucial to place greater emphasis on this aspect, particularly in regions with a significant population of camel herders.
2. It is important to educate patients about the potential consequences of ingesting raw milk, especially for those at higher risk, such as the elderly and immunocompromised individuals. Although rare, this infection can manifest in various parts of the body, and its impact has been documented.

## Abstract

**Introduction:** Bakers (popliteal) cysts are cystic masses that arise from bursae swellings filled with synovial fluid. It is assumed that preceding osteoarthritic or meniscal injuries cause the synovial fluid to extrude and concentrate, forming a gel-like material within a cyst. Clinical presentation is either symptomatic or asymptomatic swelling. The following symptoms are commonly associated with this condition: Knee pain, stiffness, and limited knee range of motion. Based on symptomatology and etiology, the management plan can be divided into conservative versus surgical intervention, by either decompression or excision. In most cases, baker cysts are not associated with infections. However, in our case report, we found that the patient had a positive Brucella culture in a symptomatic baker cyst.

**Case Report:** This is an 84-year-old gentleman, who is known to have diabetes, hypertension, dyslipidemia, and heart disease presented to the emergency medicine department with complains of knee pain and swelling. The patient mentioned a recent ingestion of unpasteurized milk and a positive history of brucellosis infection years ago. The knee aspiration of the cyst resulted in a positive Brucella culture. The treatment involves eradicating the infection with intravenous antibiotics and then decompressing or excising the cyst, depending on the patient's clinical symptoms. Regarding our management approach, the patient underwent a conservative management with intravenous antibiotics.

**Conclusion:** In comparison to other more common organisms, such as Staphylococcus aureus species, Brucella is rarely found in baker's cysts. However, as demonstrated in our case report, it is important to keep infections, as rare as brucellosis, in the differential diagnosis of baker's cysts to provide the most appropriate management for patients.

**Keywords:** Popliteal, baker's cyst, brucellosis, knee aspiration.

## Introduction

Baker synovial cyst also known as a popliteal cyst is defined as a synovial cyst that occurs due to intra-articular knee disorders, for example, osteoarthritis and meniscus tears [1]. It manifests mainly as a posterior knee mass, pain, and limited knee range of

motion (ROM). Baker cysts have two different treatment plans, either to proceed with

conservative or surgical management [2]. Asymptomatic small cysts can be managed conservatively, as opposed to large or symptomatic cysts which can be treated by either surgical

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## Author's Photo Gallery



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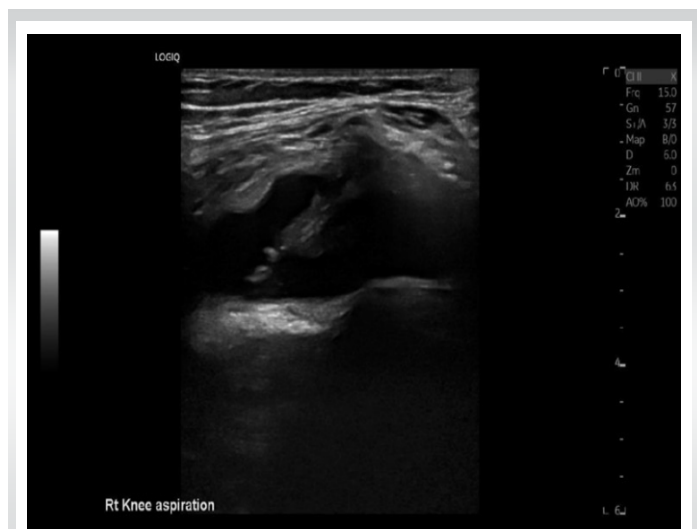
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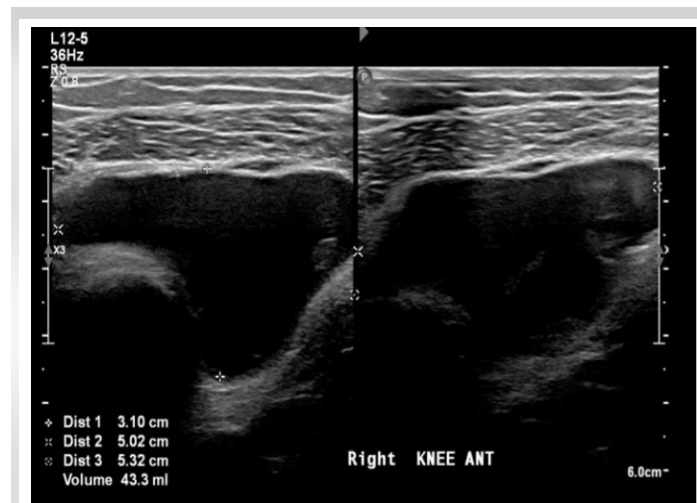
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**Figure 1:** US-guided aspiration as seen in the figure the appearance of hypoechoic swelling represented the effusion, the aspiration done under US guided for investigating the fluid culture and white blood cell count. US: Ultrasound.

aspiration or excision [2]. Baker cysts are usually a non-infectious joint effusion that seldom gets infected as a complication, however, the most common organism cultured is Gram-positive cocci, *Staphylococcus aureus* [3]. Previous studies reported a relationship between popliteal cysts and arthritis that were caused by infections such as *Candida*, *Aspergillus* species, and tuberculosis [4, 5, 6]. Nevertheless, it is very unusual to have a baker's cyst as a presentation of brucellosis.

Brucellosis is a zoonotic infection transmitted by contact with infected animals and their products such as raw unpasteurized milk [7]. It affects a wide range of angles, such as patients' well-being, lifestyle, and economic status [8, 9]. The severity of brucellosis in KSA is so extreme that it can be used as a gauge of



**Figure 2:** Knee ultrasound here is the measurements of the hypoechoic lesion representing the swelling fluid which measured 3.10 cm × 5.02 cm × 5.32 and the volume was 43.3 mL.

the disease's widespread prevalence as shown by a study done by Al Shammari et al. [10] Brucellosis frequently manifests as an intra-articular infection through hematogenous spread; the sacroiliac and knee joints are the most involved [11]. Therefore, in this case, we report the rare presentation of cultured *Brucella* in Baker's cyst aspiration.

### Case Report

This is an 84-year-old gentleman, who is a known case of diabetes, hypertension, dyslipidemia, non-alcoholic steatohepatitis, irritable bowel syndrome, transient ischemic attack, lung cancer primarily with bone metastasis, and bilateral knee osteoarthritis. He had a positive history of brucellosis 5 years ago which was treated. On August 22, 2023, the patient was brought by his son asking for knee aspiration because his father was complaining of right knee pain and increased back pain. Thus, ultrasound-guided aspiration was performed for his right knee and reported and 80 cc was cultured (Fig. 1). On August 30, 2023, the patient was called and asked to come immediately for admission as the aspirated fluid showed positive results for *Brucella* species. In addition, the culture was sent for a susceptibility test and found to be sensitive to trimethoprim, ciprofloxacin, tetracycline, and gentamicin. Afterward, the patient was admitted after he was seen in the emergency department, denying a history of trauma, worsening of pain or swelling, or any other complaints.

On physical examination, the patient was alert, conscious, and oriented; and was vitally stable and afebrile. Posterior mass was appreciated in his right knee with a size of 5 × 10 cm, soft in consistency, fluctuating, and non-tender, no inflammatory signs were apparent such as erythema, hotness, or discharges. In addition, cautery signs on his bilateral knees were found with full ROM and intact distal neurovascular examination. His work-up results showed low white blood cell count levels while the erythrocyte sedimentation rate (ESR) level was high as shown in Table 1. On right knee ultrasound, findings showed moderate to large joint effusion with no definite synovial thickening (Fig. 2).

The patient was given an antibiotic course of 100 mg gentamicin Q24 IV, 400 mg ciprofloxacin Q12 IV, and 100 mg doxycycline Q12 PO. On daily round follow-up, the patient was seen complaining of mild redness without itchiness that started on the 2nd day of admission involving forearms and lower limbs bilaterally and ciprofloxacin was stopped by the infectious disease (ID) team while continuing on doxycycline and gentamycin.

Later, the patient was doing well with no active issues, continued antibiotics for 7 days IV/PO, and was discharged

Test code	Result	Reference value
WBC	4.8	4–11 × 10 <sup>9</sup> /L
CRP	1.7	0–5 mg/L
ESR	7	0–15 mm/h
Brucella antibody	IgG 20.42	0–9
IgG and IgM	IgM 4.05	<9 is Negative
		9–11 is Borderline
		if >11 is positive UNIT
<b>WBC: white blood cell, CRP: Greactive protein, ESR: Erythrocyte sedimentation rate, IgG: Immunoglobulin G, IgM: Immunoglobulin M</b>		

Table 1: Laboratory work-up.

home on September 06, 2023, doing well with doxycycline 100 mg Q12 PO for 90 days and his regular medication refill and a follow-up appointment with orthopedics and ID in 1 week and 2 weeks, respectively.

### Discussion

As mentioned previously, the focal presentation of brucellosis involves joint manifestation, in which the commonly reported part was the knee [7]. Nevertheless, insufficient reported cases were found. One case was reported in 1996, where a medically free 60-year-old male presented with a 5-month history of fever, night sweats, and popliteal swelling and tenderness after drinking raw milk. Patients reported to have elevated (ESR) in contrast to our case in which it was a normal level. The computed tomography and US showed the presence of a popliteal cyst. After aspiration of the cyst and culturing, the synovial fluid showed to have *Brucella abortus* [12]. Thus, the patient was managed by streptomycin and doxycycline and then discharged. Later follow-up showed the disappearance of his effusion and Baker's cyst. However, after 10 days, the patient was readmitted due to a flare-up of his manifestation. Open drainage and resection of his Baker's cyst were needed and then antibiotics were maintained. Later after 4 months, the patient was asymptomatic and imaging results of his right knee were

normal [12].

In another more recent case reported in 2015, a 55-year-old diabetic male presented with a history of fever and left knee pain for 7 days along with tenderness in the left popliteal fossa, redness, and swelling [11]. Furthermore, the patient had elevated ESR levels while other laboratory findings were normal. Fluid aspiration and analysis of the cyst were performed and revealed the presence of *Brucella* species [11]. Management was started by giving ciprofloxacin, gentamicin, and doxycycline. The patient was discharged after 7 days of admission and then on a follow-up appointment he was afebrile, and his swelling had resolved. Nonetheless, both previous examples showed infectious signs and symptoms in the form of fever, night sweats, redness, and tenderness, respectively, before being diagnosed with brucellosis, as opposed to our case in which the patient's only symptoms at the time of aspiration were pain, swelling, and he was completely asymptomatic and electively admitted at the time of the diagnosis.

### Conclusion

Although brucellosis is rare to be found in baker cyst fluid aspiration, it is highly crucial to keep in mind that it could be one of the differential diagnoses. Therefore, physicians are recommended to be aware of this possibility, especially since brucellosis has been increasing in developing countries such as Saudi Arabia.

### Clinical Message

Healthcare practitioners should maintain a high index of suspicion when treating camel herders, as this population may have an elevated risk of infection manifesting in various body parts. A thorough management plan is essential for these rare cases, encompassing appropriate antibiotic therapy, clear indications for surgical intervention, and scheduled follow-up appointments. Although these infections are uncommon, they have been well-documented and require careful consideration in clinical practice.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil **Source of support:** None

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