

CASE REPORT

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# Hip joint rice body bursitis combined with hip dysplasia and pelvic fracture: a case report

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## Abstract

**Background** Rice body formation is an uncommon, nonspecific inflammatory process. Certain clinical features, such as chronic synovitis associated with rheumatoid arthritis, tuberculous arthritis, and osteoarthritis, can induce a non-specific response that may lead to the development of rice bodies. Currently, the etiological and prognostic significance of rice bodies remains unknown. Magnetic resonance imaging (MRI) is the preferred diagnostic imaging modality for evaluating rice body formation.

**Case presentation** The patient, a 44-year-old female, presented with bursitis of the hip joint and the presence of numerous rice bodies. This case is exceptionally rare and unusual as it involves a combination of hip dysplasia and pelvic fracture. The patient underwent a one-stage resection of the rice body, internal fixation of the acetabular fracture, and two-stage total hip arthroplasty, resulting in an immediate improvement in her symptoms. We reviewed the relevant literature and observed that the majority of rice bodies were predominantly found within the capsules of the shoulder and knee joints, while instances of hip joint rice body bursitis were relatively infrequent. To our knowledge, there have been no previous reports documenting a case of hip joint rice body bursitis in conjunction with hip dysplasia and pelvic fracture.

**Conclusion** This paper presents the rare case of hip joint rice body bursitis combined with hip dysplasia and pelvic fracture, and is one of the highlights.

**Keywords** Hip joint rice body bursitis, Hip dysplasia, Pelvic fracture, Treatment, Case report

## Background

Most commonly associated with chronic inflammation, rice bodies are an uncommon, nonspecific, and usually intra-articular inflammatory process [1]. Hip joint bursitis with rice bodies is relatively uncommon. Currently, the research on the pathogenesis of rice body formation

is still relatively superficial, however, several clinical features such as a non-specific response to chronic synovitis associated with rheumatoid arthritis, tuberculous arthritis, seronegative inflammatory arthritis, juvenile rheumatoid arthritis, and osteoarthritis, can contribute to the development of rice bodies [2, 3]. They are referred to as rice bodies due to their resemblance to white rice and primarily occur within the joint capsule of the shoulder and knee [4]. Microscopically, rice bodies are mainly composed of eosinophilic nuclei and fibrin [5]

In this paper, we present a rare case involving hip joint rice body bursitis combined with hip dysplasia and pelvic fracture.

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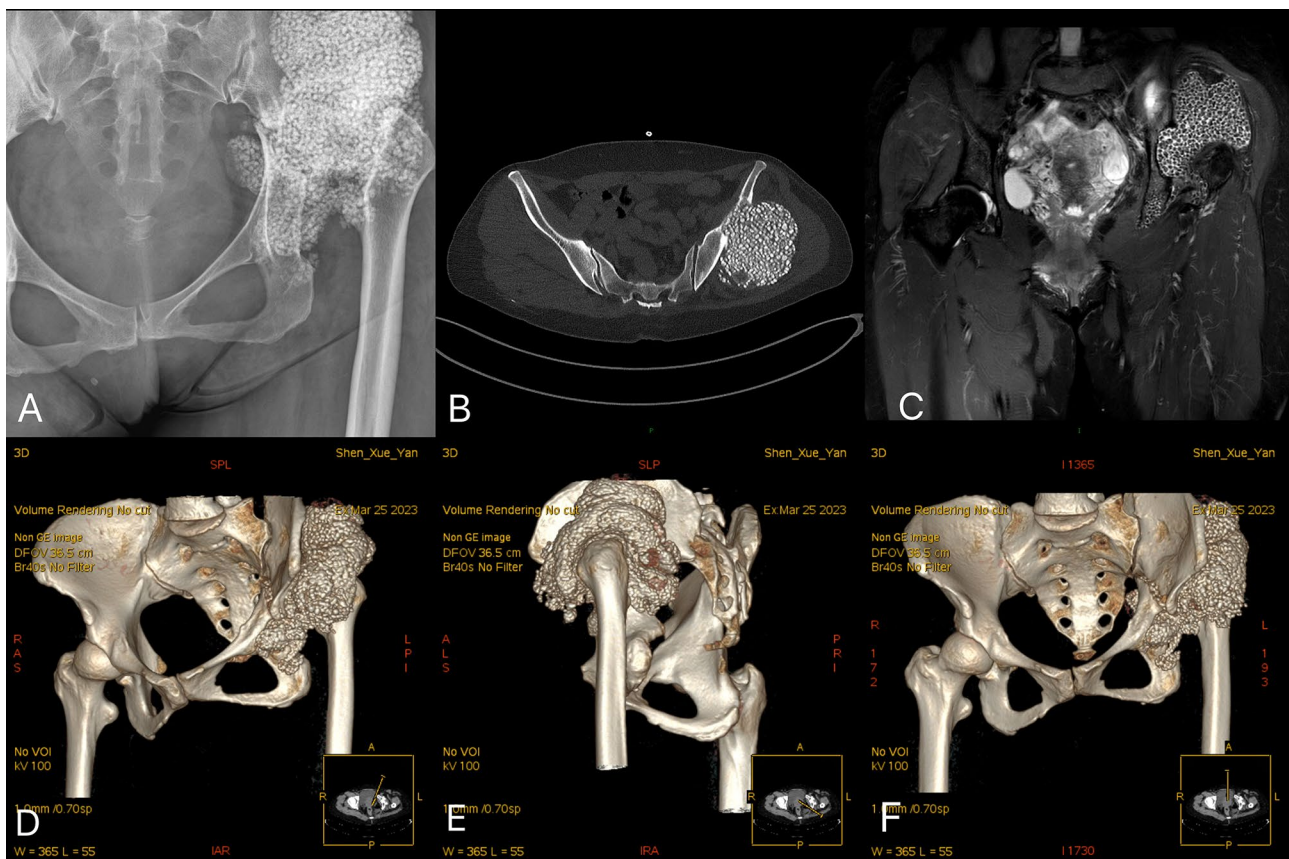
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**Case presentation**

The patient, a 44-year-old female, was admitted to the hospital due to longstanding limited mobility of the left hip joint for over 40 years and recent onset of pain persisting for 6 months. Upon further inquiry into her medical history, it was discovered that the patient’s left hip joint movement was limited more than 40 years ago without obvious cause, which gradually aggravated and led to difficulty in walking. No comprehensive diagnostic evaluation or treatment interventions were pursued during this period. Over the past six months, the patient has been experiencing intermittent concealed pain in her left hip joint that exacerbates following activities and slightly alleviates with rest. The limitation in physical activity has significantly intensified, rendering her bedridden and severely impacting her daily life. The patient had a history of previous caesarean section. Her admission examination results were as follows: T36.3 °C, P85 times/min, R18 times/min, BP135/77 mmHg. She exhibited normal mental status and displayed cooperation during the examination. The skin of the left hip joint showed no signs of redness or swelling, and there was no swelling in the left lower limb. The left lower extremity appeared shortened in external rotation, with widening observed in the left

hip joint. There was no pressure percussion pain in the lumbar spine, and the leg raising test for the left lower limb yielded negative results. Additionally, positive findings were noted on the Trendelenburg test, Allis sign and the “4” test. Limited movement of the left hip joint was observed in all directions, and ankle joint activity was normal. Physical examination also revealed good pulsation of the dorsalis pedis artery, normal peripheral blood circulation in the limbs. Ancillary examinations indicated hip joint rice body bursitis accompanied by hip dysplasia and transverse acetabular fracture (Judet-Letournel classification). (Fig. 1)

Before surgery, it is crucial to engage in comprehensive communication with patients and their families regarding the surgical approach and associated risks, particularly emphasizing the potential for postoperative infection, poor healing of the incision, intraoperative damage to peripheral nerves and blood vessels, as well as incomplete removal of the free body. Regarding the surgical approach, if the pelvic fracture is stable and the synovitis is not serious, then one-stage hip arthroplasty surgery will be performed; otherwise, two-stage surgery will be conducted. Patients and their families fully understand and accept the risks of surgery. The patient was operated

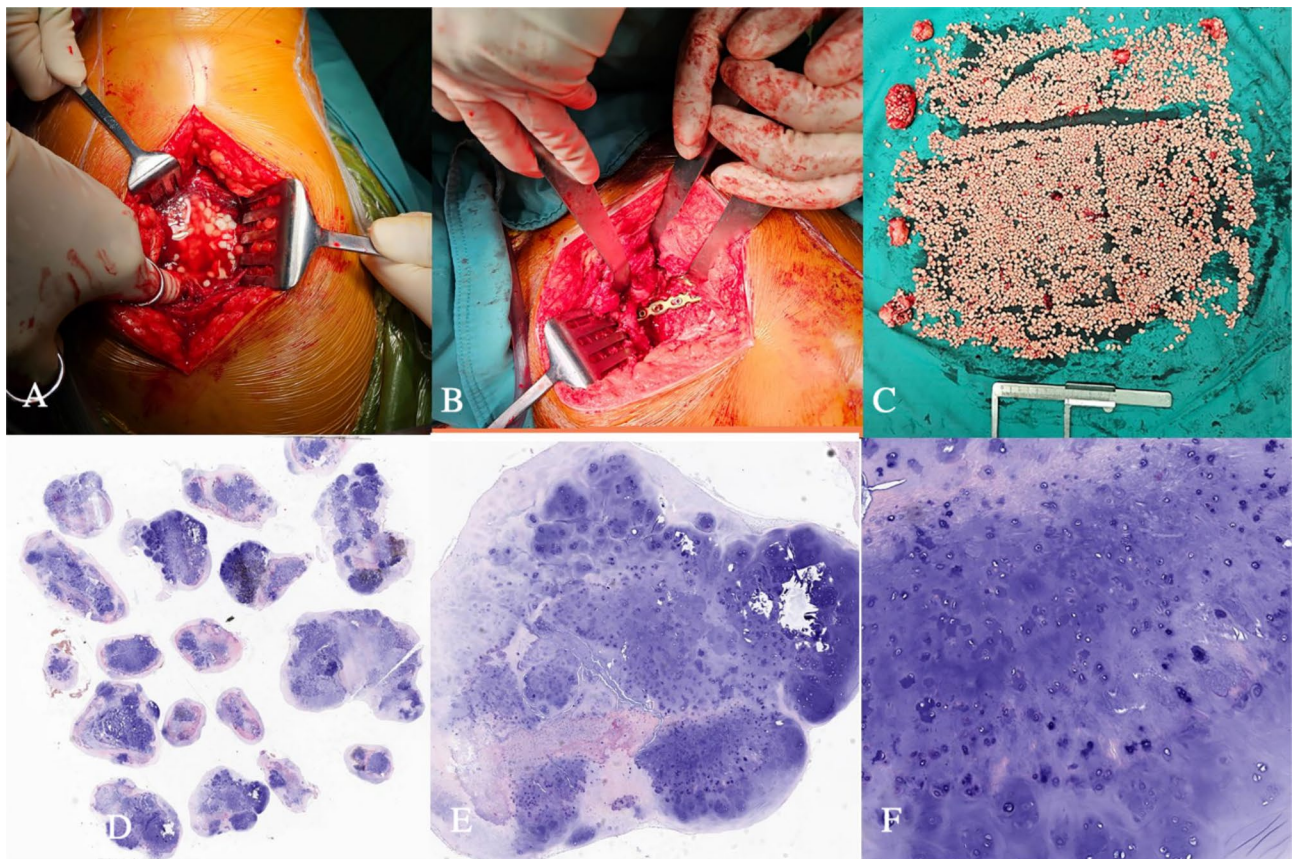


**Fig. 1** (A-F) X-ray, CT, MRI, and three-dimensional reconstruction results showing left hip dysplasia, transverse acetabular fracture (Judet-Letournel classification), and rice body bursitis

on March 27, 2023 using modified Hardinge surgical approach. Compared with the Hardinge approach, the modified Hardinge approach is in front of the gluteus medius muscle, and the risk of injury to the superior gluteal nerve is greatly reduced. This approach is minimally invasive and simple, with clear exposure and few complications [6, 7]. Severe synovitis and unstable pelvic fracture were observed during the operation. Therefore, we performed rice body resection of the left hip joint and open reduction internal fixation of pelvic fractures. After the successful administration of general anesthesia combined with nerve block anesthesia, the patient was positioned laterally with the affected side facing upwards and the skin was sterilized as per routine. Subsequently, a lateral incision measuring approximately 20 cm in length was made at the hip, followed by sequential muscle layer incisions. The joint capsule was then incised while shifting the gluteus medius muscle towards the proximal section. Intraoperatively, a large number of rice-sized free bodies were observed emerging from the incised joint capsule, which had been thoroughly cleaned out, and some free bone fragments were observed in it. At the same time, free body attachments could be seen on some

iliac surfaces and the true socket. The femoral head was displaced proximally, and the pelvis was fractured above the real acetabulum with anterior-posterior penetration and granulation tissue growth at the fracture end. The fracture end was thoroughly cleaned of granulation tissue and reset. A 5-hole reconstruction locking plate was inserted from approximately 3 cm above the fracture end towards the ischial direction. After passive activity, the fracture was stabilized, and the dislocated femoral head was partially fragmented and implanted into the fracture end. Finally, the wound was irrigated. After confirming the absence of active bleeding, the wound was meticulously closed in layers, intra-articular injection of tranexamic acid 2.0 was administered, and a drain was inserted. Postoperative measures were implemented for anti-inflammatory, anti-swelling, and thrombosis prevention purposes, along with rehabilitation exercises following the ERAS (Enhanced Recovery After Surgery) concept. (Fig. 2).

Considering the severe synovitis of the hip joint as well as the instability of the fracture, a total hip arthroplasty was performed in the second stage. The prosthesis we chose was the second-generation Wanger Cone



**Fig. 2** (A) After the incision of the joint capsule was made, a large amount of rice bodies and cystic fluid gushed out. (B) Open reduction internal fixation of pelvic fractures. (C) Intraoperative removal of bone fragments and thousands of rice bodies. (D-F) From low to high magnification, the pathological examination showed fibrous connective tissue with calcification along with free body formation

designed by Professor H.Wagner in Germany. It is a Tapered Spline, which has unique advantages in rough surface, axial and rotational stability and long-term osseointegration.

Preoperative communication with patients and their families is of utmost, particularly in regards to the potential risks associated with postoperative infection and non-union of fractures. Patients and their families have demonstrated comprehension and acceptance of these risks. On July 24, 2023, a total hip arthroplasty was performed under general anesthesia combined with nerve block anesthesia. Intraoperatively, we observed hyperplasia of granulomatous tissue in the hip joint, dislocation of the femoral head in an upward and backward direction, and satisfactory healing of the pelvic fracture. Following removal of the granulomatous tissue, weakness was identified in the anterior wall of the acetabulum. The acetabulum was sequentially ground to a size of 40 acetabular files, which could not be further enlarged, and the upper wall of the acetabulum exhibited defects. Subsequently, allograft bone was used for allografting the acetabulum and secured with screws. The tube was then flushed, followed by insertion and securement of a 42-gauge acetabular prosthesis using three screws while placing a polyethylene liner. Additionally, the femoral marrow cavity was grooved, and osteotomy of the femur under the rotor was performed at approximately 2.5 cm with pre-bundling wires at its proximal and distal ends. The femur was sequentially enlarged to a 14-gauge femoral marrow file, rinsed, and reset, and the 14-gauge femoral prosthesis was firmly inserted into place. Finally, a 22 mm diameter standard neck-length femoral metal ball was placed. After reduction, the hip joint could move in all directions without dislocation; the osteotomy block was securely tied and fixed at the osteotomy end and rinsed. When the wound was flushed and the instruments and gauze were counted correctly, a drain was placed, followed by intra-articular injection of tranexamic acid and closure of the wound layer by layer. Then, it was followed by anti-inflammatory and anti-oedema treatments, as well as

thrombosis prevention. The patient recovered well and was discharged on the fifth postoperative day.

The patient was followed up at one month and eleven months after operation, respectively, and X-rays showed good fracture healing.(Fig. 3).

## Discussion

Rice bodies were initially proposed by Riese [8]. They were found to be associated with tuberculous arthritis, exhibiting an appearance similar to refined white rice grains. Immediately following the relevant study, it was found that the formation of rice bodies were also associated with rheumatoid arthritis, seronegative inflammatory arthritis, juvenile rheumatoid arthritis and osteoarthritis [2, 3, 9]. Rice bodies can float freely in joint fluid or attach to the synovium, which are considered nonspecific reactions and final products of chronic inflammation, hyperplasia, and secondary degeneration [4]. Microscopic examination reveals that the majority of rice bodies consist mainly of fibrin with a small amount of collagen, while a minority are composed solely of fibrin [3].

This work describes a case of hip joint rice body bursitis. Intraoperatively, rice bodies were observed attached to the joint capsule and synovium, suggesting that rice bodies may be originated from synovial tissue, which is consistent with previous literature [10]. Clinically, its main differential diagnoses include femoral head tumours, joint tuberculosis, synovial osteochondromatosis and pigmented villous nodular synovitis. Patients with femoral head tumors can be diagnosed using X-ray and MRI, in addition to presenting symptoms such as hip pain, limited mobility, and claudication. These manifestations can be distinguished from rice body bursitis of the left hip joint. Patients with joint tuberculosis may exhibit symptoms including low-grade fever, night sweats, and weakness. Other indicators include a positive tuberculin test, cloudy arthrocentesis fluid, and acid-fighting bacilli. Patients have been excluded from the diagnosis of joint tuberculosis due to the absence of corresponding symptoms. In terms of diagnostic imaging, ultrasound imaging and MRI are relatively effective modalities for diagnosing



**Fig. 3** (A) X-ray manifestations after rice body removal and acetabular fracture fixation for three days. (B) X-ray manifestations after hip joint arthroplasty for one month. (C) X-ray findings after hip joint arthroplasty for eleven months

rice body bursitis and can be distinguished from synovial osteochondromatosis and pigmented villous nodular synovitis. On ultrasonography, rice bodies predominantly appear as hypoechoic or echoless spherical intracapsular nodules but may be difficult to differentiate from synovial chondromatosis [3], and on MRI, rice bodies show low-signal T1- and T2-weighted sequences. In contrast, synovial chondromatosis nodules exhibit a high signal density on T2-weighted images because of the presence of a cartilaginous component. Moreover, pigmented villous nodular synovitis can be differentiated via MRI [3]. Currently, MRI is the preferred modality for evaluating mitochondrial formation through diagnostic imaging [11].

In addition to the aforementioned, the patient presented with a concomitant pelvic fracture and hip dysplasia. However, there was no literature describing the treatment of a similar case. Following departmental discussion, we conducted two surgical procedures on the patient. The primary objective of the second operation was to prevent infection and address potential instability associated with the pelvic fracture. Currently, the patient is exhibiting satisfactory recovery, validating the success of our surgical intervention and treatment strategy, thereby providing a valuable reference for future cases.

## Conclusion

The occurrence of rice body bursitis in the hip joint is relatively uncommon, and there are even fewer reported cases involving a combination of hip dysplasia and pelvic fracture. Following appropriate treatments, the patient successfully resumed normal work and daily activities, providing valuable insights for clinical practice.

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## Author contributions

A and B wrote the main manuscript text and C,D,E were responsible for Data collection and processing. F,G reviewed and revised the manuscript. H was responsible for the entire project. All authors reviewed the manuscript.

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## Data availability

No datasets were generated or analysed during the current study.

## Declarations

### Ethics approval and consent to participate

Not applicable.

### Consent for publication

Written informed consent was obtained from the patient for publication in this report and any accompanying images.

### Competing interests

The authors declare no competing interests.

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