

## Massive “risotto bursitis” of the great trochanter bursa after proximal femoral varus osteotomy with 5,0 LCP- a case report.

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**Abstract**— The “risotto phenomenon” is a rare pathologic finding, mostly seen as a nonspecific response to chronic inflammation around the shoulder joint-subacromial and subdeltoid bursitis, rheumatoid arthritis, sero-negative inflammatory arthritis, septic arthritis and tuberculous arthritis.<sup>9,17</sup> A few scientific reports associate rice body formation with the use of different type of osteosynthesis, bony anchors and bioabsorbable sutures.<sup>16</sup> They are usually an incidental asymptomatic finding, requiring no specific treatment, but could be symptomatic demanding surgical excision.<sup>17</sup> We present the clinical case of a 17-year- old female patient with a “risotto bursitis” of the great trochanter bursa, documented during planned surgical removal of a locking compression plate after proximal femoral varus osteotomy for bilateral developmental dysplasia of the hip treatment.

**Keywords**—“risotto bursitis”, hip joint, locking compression plate

### 1. INTRODUCTION

Rice body formation is initially described in association with tuberculosis.<sup>7,15</sup> Recent studies associate it with chronic inflammation bursitis, rheumatoid arthritis, atypical mycobacterial arthritis, juvenile arthritis.<sup>9,10,12</sup> There is no definite etiology known for the “risotto phenomenon” and it is mostly associated to nonspecific response to chronic inflammation of the synovial layer of the joint capsule.<sup>18</sup> The term “risotto” is defined by the morphologic resemblance of the bodies to grains of polished white rice.<sup>18</sup> They consist of inner core from acidophilic material and outer layer of fibrin and collagen. The most common location seen is the shoulder and knee joint.<sup>2,11</sup> Proliferation around the hip joint is extremely rare.<sup>6</sup> The differential diagnosis is done with synovial chondromatosis, infection and neoplastic process.<sup>19</sup> No similar finding was described in the literature concerning the complications of osteosynthesis of hip osteotomies with LCP plates in pediatric age. This is the reason for publishing the present case.

## 2. CLINICAL CASE

We present the clinical case of a 17-year-old female patient, who underwent surgery for developmental dysplasia of the hip 6 years ago in the Pediatric Department of our clinic. A bilateral derotational osteotomy of the proximal hip with a locking compression plate (LCP Pediatric Hip Plates 5.0 DePuy Synthes). The present hospitalization is for plate removal from the right hip joint. No restricted range of motion, anamnestic, clinical or paraclinical signs of local inflammation were documented during the pre-operative examination of the patient. We observed no swelling or crepitations in the trochanteric region. There were no signs for changes in the surrounding soft tissues or calcifications formation on the conventional AP and lateral radiographs. During the surgical intervention performed through standard lateral approach, the trochanteric bursa was found with pathological shape, size 120/90 mm and thickened membrane. After incision of the trochanteric bursa, we encountered multiple whitish colored rice bodies with a total mass of 160gr. (Fig. №1 ) The bursa was totally excised for histologic examination. It confirmed the presence of a cystic formation with proliferative layer of monocytoïd cells and inflammation in the cystic membrane and the pericyclic tissues.

The osteosynthesis from the contralateral side was removed in the same surgical intervention. We found no similar pathologic findings in the soft tissues around the left hip joint. The surgical incisions underwent primary wound healing in physiological terms. The patient is subjected to regular clinical checks for the developmental dysplasia of the hip and is likely to undergo early total hip arthroplasty.

## 3. DISSCUSION

The risotto bursitis is a rare surgical complication. It was initially reported by Reise et al. (1895) in a patient with tuberculous arthritis.<sup>15</sup> It is mostly registered in rheumatoid arthritis in the area of the upper extremity (shoulder joint).<sup>14</sup> The ethology is still unknown. Some authors define it as a fragmentation process of the adjustment bone, in which bone fragments pass through microinfarctions of the synovial layer of the joint capsule<sup>4</sup>. Galves et al. state that rice bodies form around cell elements in the fibrous exudate of the inflamed synovial fluid.<sup>8</sup> Other authors define it as parts of destroyed synovial villas.<sup>1</sup>

The condition is generally an accidental finding during surgery, but in some cases it could be symptomatic accompanied by regional pain and clinical signs of inflammation in the affected anatomical region. Total surgical excision of the rice bodies is a definitive treatment option providing pain relief and excellent outcomes.<sup>14,17</sup>

Most of the scientific reports on the topic define the „risotto“ phenomenon as a non-specific reaction of the synovia towards an implant. Sivaloganathan described rice bodies after surgical rotator cuff repair using bioabsorbable anchor.<sup>16</sup> Literature review found only one article documenting „ risotto bursitis“ in the hip joint region, in a 42-year old patient after femoral neck fracture osteosynthesis. It was performed using 3

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titanium cannulated screws, which underwent aseptic loosening.<sup>6</sup> Paediatric cases were reported only in rheumatoid arthritis patients. Such is described in a 2-year-old patient with history for asymptomatic swelling of right knee joint.<sup>5</sup> Only one „risotto“ phenomenon case was reported in our department, despite the great surgical experience with LCP paediatric hip plate osteosynthesis (in 450 proximal femoral osteotomies).

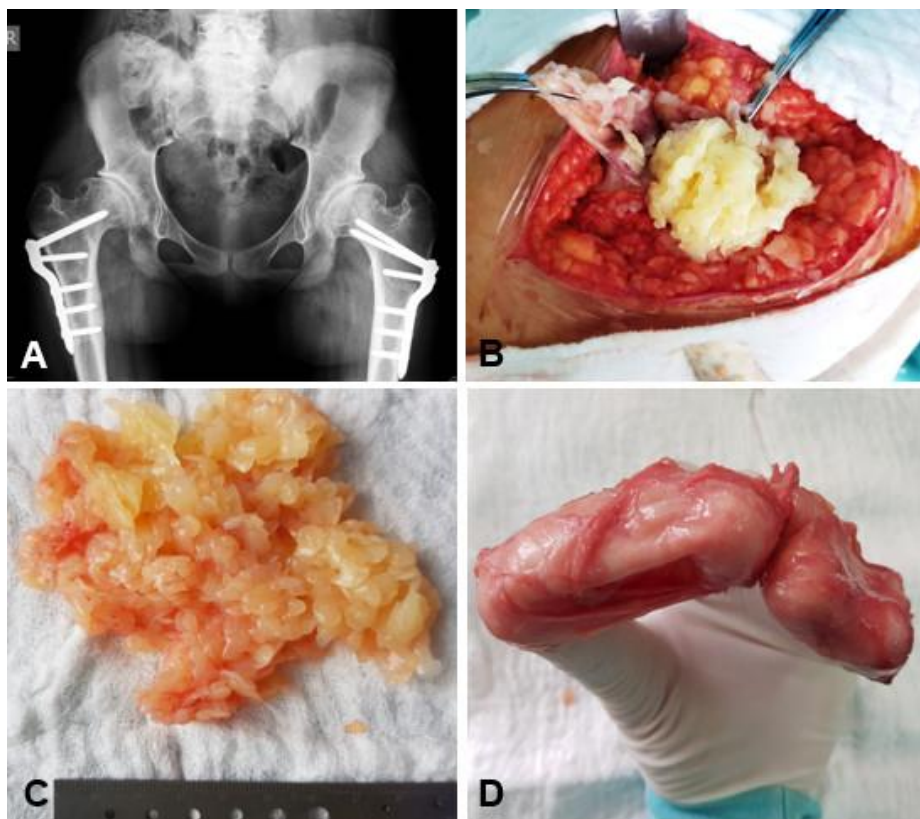


Figure №1 **A.** Conventional radiography (AP view) of the 17-year-old patient 6 years post bilateral varus osteotomies of the proximal femur. **B.** Intraoperative finding after surgical incision of the trochanteric bursa. **C.** The pathologic finding- round shaped whitish rice bodies with total mass of 160gr. **D.** The trochanteric bursa with pathologically thickened membrane and enlarged size.

Paediatric LCP plates are normally removed 8 to 12 months post operation. In the case described, extraction was performed 6 years postoperatively. The reason was the non-cooperative parents, who missed the regular checks of the patient. This could be a potential reason for the pathological finding. We found no reasonable explanation about the unilateral nature of this surgical complication. We recorded no data for postoperative complications during the primary surgery.

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Titanium and steel implants both have high biological adaptivity, although rarely there are adverse effects. There are several theories about adaptive immunological response induction after metal osteosynthesis. There is insufficient data regarding bone healing reaction to implants. Latest publications show that steel implants disrupt the antioxidative barrier, increase the oxidative stress, induce mitochondrial changes in the periosteum, free radicals release and local apoptosis. Local inflammatory response and apoptosis are the main factors for implant osteointegration complications. Boris et al. (2019) evaluated the level of pro-oxidant enzymes, cytokines as well as pro- and anti-apoptotic proteins in the periosteum of 29 patients with titanium implants (3). They reported NADPH oxidase и xanthine oxidase enzymes high activity, as well as increased release of free radicals in comparison with a control group of patients. Markers of inflammation were higher in all cases with titanium implants. An US FDA report from 2019 described the FBR (Foreign Body Response) phenomena, as an autoimmune response toward implants. It is associated with coordinated inflammation mechanisms leading to local side effects: pseudotumor formation, tissue granulation, fibrous changes in the capsule and others. (13). Those mechanisms could be etiologic factors for rice body formation.

#### **4. CONCLUSION**

Chronic irritation from metal implants, could lead to local aseptic inflammatory condition, resulting in rice body formation in the bursa. Rice bodies are usually found in asymptomatic patients as an accidental intraoperative finding. We therefore advise for on-time extraction of the locking compression plate when radiographic bone healing has occurred.

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