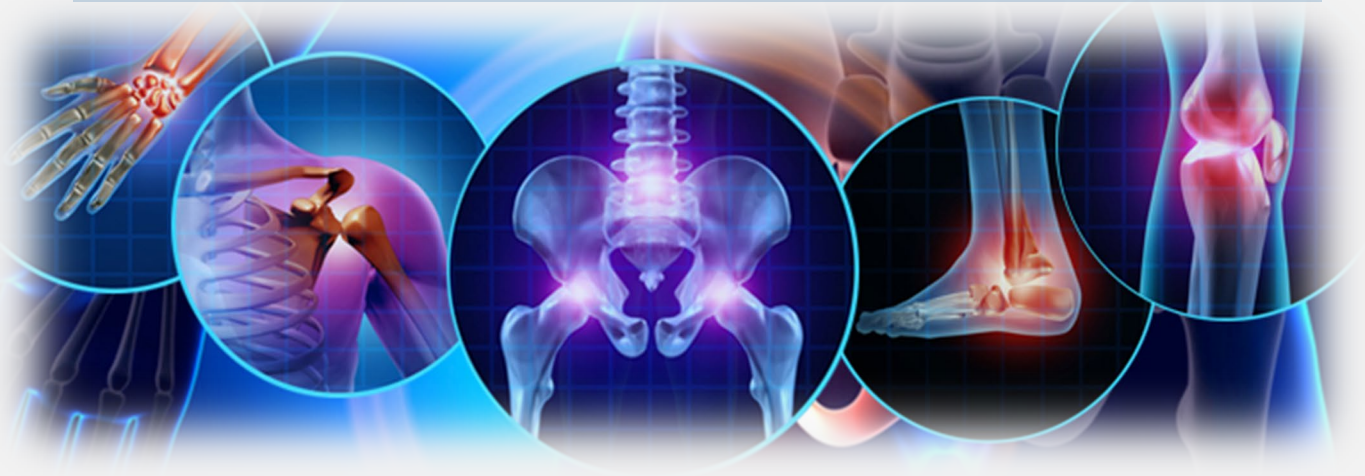


ORTHO NEWSCAST



Volume 3|Issue 23|2022

Dear Doctor,
Greetings from Micro Labs. We are happy to bring you "Ortho Newscast" which contains latest and interesting news in the field of Orthopaedics.

This issue contains

1. A constant MRI retear rate, single row rotator cuff surgery produces satisfactory clinical outcomes
2. Third generation Ceramic-on-Ceramic total hip arthroplasty in patients under 45 years of age: a multi-center retrospective comparative study with or without the sandwich liner 10 years at the least
3. The function of joint aspiration prior to reimplantation in patients who already have a cement spacer in situ
4. A Case Report for the Treatment of a Rare Solitary Metastasis Shaft of the Humerus with Pathological Fracture Using Intercalary Resection and Nail Cement Implantation

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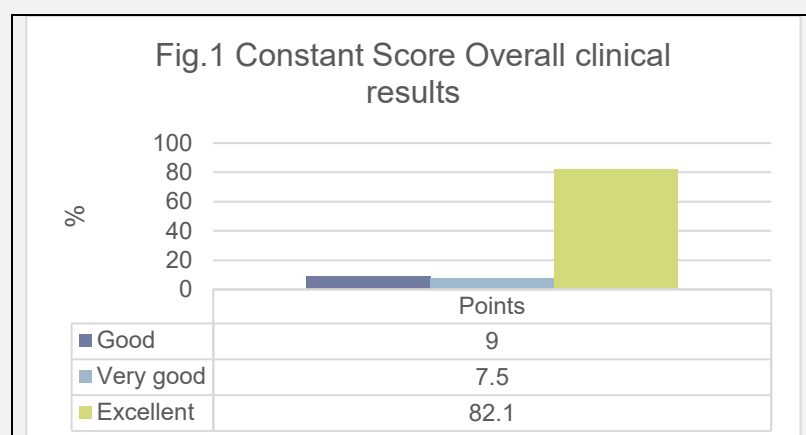
A constant MRI retear rate, single row rotator cuff surgery produces satisfactory clinical outcomes

Repairs for rotator cuff tears (RCT) are among the most frequent shoulder operations. Though tendon-to-bone healing is dependent on a number of variables, including biomechanical and biological ones, the latter of which is impacted by the patient's age, it is not always effective or predictable. The frequency of failed rotator cuff repairs is rising along with the population's increased ageing.¹ According to the prevalence rate, 20.7% of those who have the ailment have a full-thickness rotator cuff tear, and as people become older, the incidence also rises. 40 percent of asymptomatic individuals over 50 had full-thickness rotator cuff injuries.² When symptoms do not subside with conservative therapy during the past three decades, arthroscopic repair of the rotator cuff tear has emerged as the gold standard procedure. The single row (SR) and double row (DR) repairs are the two primary surgical methods used to repair a cuff tear. The goal of this study is to assess a group of patients who had single row (SR) rotator cuff repairs and compare their clinical outcomes to the results of MRI scans.³

Retrospective selection of patients who underwent arthroscopic rotator cuff repair. 131 patients in all met the inclusion criteria. At the end of the study, 64 subjects, 18 men and 46 women and 67 rotator cuff repairs, with a mean follow-up of 19.5 ± 5.7 months (range 12-28 months) were included. All of the patients had a full-thickness rotator cuff tear, which was then addressed using the arthroscopic SR repair method. The Disability of the Arm, Shoulder and Hand (DASH) questionnaire and the Constant-Murley Score were used to clinically evaluate each patient's satisfaction. Additionally, the Sugaya score was used to rate the integrity of the rotator cuff reconstruction as determined by MRI.

The average Constant score was 82.8 ± 13.0 , and 55 patients had very good outcomes. No patient had a score below 30, which would be considered unsatisfactory (Fig.1). On the DASH questionnaire, patients judged their clinical outcomes in 6.1 percent of cases as unsatisfactory and in 75.8 percent of cases as outstanding. 45 patients (83.3%) were classified by postoperative MRI as having Sugaya types I, II, or III, whereas 9 patients (16.7%) had a Sugaya type IV consistent with a full-thickness cuff retear. Of these nine individuals, the Constant score and DASH questionnaire both yielded outstanding results in five (55.6%)

and three (33.3%), respectively. According to the results of the Mann-Whitney test, the retear group received lower ratings for pain (8.3 ± 5.0 compared 13.1 ± 3.4), constant score (68.8 ± 18.5 versus 83.1 ± 11.6), and DASH (66.2 ± 22.1 versus 44.2 ± 14.9) than the intact repaired cuff group (Table 1). However, range of motion (ROM) differences were not statistically significant, with the exception of the intact group's superior forward flexion ($p < 0.039$).



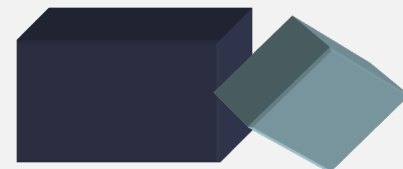


Table 1: Differences between patients with intact cuff and patients with retear in this study			
At final follow-up:	Intact cuff, n=45	Retear, n=9	p-Value
(1) Final Constant score			
Mean	83.1 ± 11.6 (57-98)	68.8 ± 18.5 (35-92)	0.018
Median	87 (n=45)	71(n=9)	
(2) Strength			
Mean	22.0 ± 4.1 (10-25)	18.4 ± 6.2 (10-25)	0.116
Median	25(n=45)	20(n=9)	
(3) Abduction			
Mean	9.4 ± 1.5 (4-10)	8.4 ± 2.2 (4-10)	0.062
Median	10 (n=45)	10(n=9)	
(4) External rotation			
Mean	8.9±2.0 (4-10)	6.9±3.6 (4-10)	0.054
Median	10 (n=45)	8 (n=9)	
(5) Internal rotation			
Mean	7.9±1.7 (4-10)	7.6±1.7 (4-10)	0.595
Median	8 (n=45)	8 (n=9)	
(6) Forward flexion			
Mean	9.6±1.1(6-10)	8.7 ± 1.7 (6-10)	0.039
Median	10(n=45)	10 9)	
(7) Pain			
Mean	13.1±3.4(0-15)	8.3±5.0(0-15)	0.002
Median	15(n=45)	10 (n=9)	
(8) Final DASH score			
Mean	44.2±14.9(30-89)	66.2±22.1 (35-91)	0.003
Median	40 (n=44)	73 (n=9)	

According to the research done by Kitridis D et al, full-thickness rotator cuff injuries are consistently underestimated in size by arthroscopic assessments. It is required to develop more accurate arthroscopic methods or instruments to assess the amount and kind of rotator cuff injuries.⁴ According to research employing the same surgical SR approach, the percentage of rotator cuff retear seen in this study is consistent with previous findings. We should also point out that no patient in the retear group had a Type V Sugaya score. SR and DR are the two most used arthroscopic rotator cuff repair methods. There are biomechanical benefits to the DR method.³

The majority of the clinically measured scores were significantly higher in the intact cuff group, despite the fact that retears were prevalent in both the repaired and torn groups. Unexpectedly, patient satisfaction and rotator cuff integrity do not significantly correlate.

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Third generation Ceramic-on-Ceramic total hip arthroplasty in patients under 45 years of age: a multi-center retrospective comparative study with or without the sandwich liner 10 years at the least

Total hip arthroplasty (THA) may benefit from the safe adoption of new technology if it is shown to be effective. The long-term survival of THA has been impacted by bearing wear and unfavourable reactivity to particle pollution. To present, metal-on-highly-crosslinked-polyethylene and ceramic-on-highly-crosslinked-polyethylene have demonstrated good wear reduction performance. Ceramic-on-ceramic (COC) bearing pairs have historically demonstrated minimal wear rates and therapeutic effectiveness. Recent issues with the bearing material's use include allegations of squeaking and fracturing of either the ceramic head or liner. An alumina matrix composite (AMC) ceramic was created to solve the problems with material fracture. This alteration to earlier alumina ceramic formulas produces a material with better toughness and wear properties.¹ The aim of the current study is to describe the fracture rate of a number of ceramic-on-ceramic THAs using a sandwich liner and a ceramic femoral head, as well as to identify the relative risk factors, potential causes, and evaluate the short- and medium-term clinical outcomes.²

In the current study, 282 patients (300 hips) who had sandwich liner ceramic-on-ceramic THA at three centres between 2001 and 2009 were retrospectively examined. Demographic data such age, weight, gender, and body mass index were used to evaluate the patient. All patients had clinical, radiographic, or computed tomographic evaluations to rule out implant fracture, osteolysis, dislocation, infection, or loosening.

Alumina liner fractures occurred in five hips (five patients) at the most recent check-up; these were updated 4, 6, 7, 10, and 11 years after the first surgery, respectively (Figure 1). Eight ases (eight hips) of the remaining hips developed regions of osteolysis surrounding the acetabular component (Figure 2). Five ceramic sandwich liners fractured (1.7%) with an average follow-up of 7.3 years. Age ($p = 0.205$), weight ($p = 0.241$), gender ($p = 0.553$), body mass index ($p = 0.736$), inclination ($p = 0.727$), and anteversion ($p = 0.606$) were all unrelated to the ceramic liner fracture. The 12-year revision point brought the total survival rate to 91.4%. Other issues included osteolysis in eight hips, two perprosthetic fractures, and two dislocations. No hip had aseptic implant loosening that could be seen.



Fig.1: (a) AP and (b) lateral view radiographs show the prosthesis with fracture of the right ceramic sandwich liner (red arrow). (c) Radiograph after revision of a ceramic sandwich fracture and a fourth generation alumina ceramic bearing was implanted.

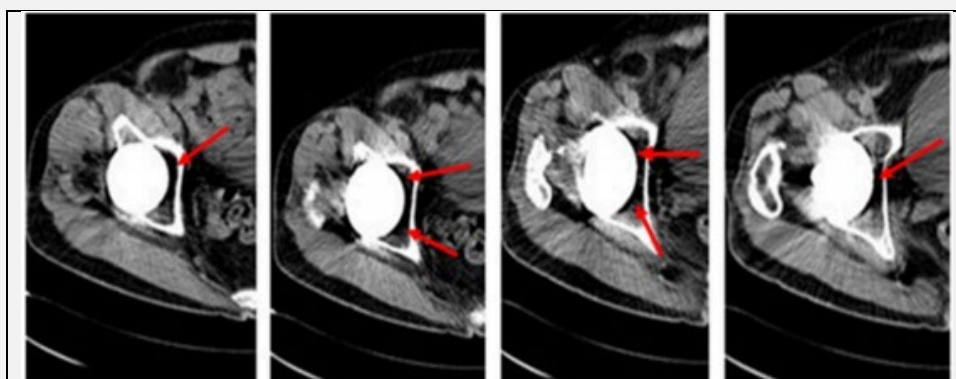


Fig.2: Computed tomographic scan of the right hip 12 years after surgery, revealing local osteolysis around the acetabular component.

The total hip arthroplasty ceramic-on-ceramic bearing (COC) was created by Pierre Boutin in France at the start of the 1970s. The mechanical qualities of ceramic materials have been enhanced during the past three decades by hot isocratic pressing, laser marking, and nondestructive proof testing.² Ceramic material advancements attempted to lessen historical issues including ceramic component fractures and squeaking. Although alumina matrix composite ceramics (Delta) show promise, there is currently a paucity of clinical evidence showing if the material advancements correspond to better therapeutic results.³

The study concluded that a high risk of alumina fracture and osteolysis may be caused by sandwich liners.

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The function of joint aspiration prior to reimplantation in patients who already have a cement spacer in situ

Total joint arthroplasty (TJA) surgery is devastatingly complicated by periprosthetic joint infection (PJI). Antibiotics are rarely enough to treat PJI since the implant does not have a direct blood supply. The therapy of PJI presents several difficult diagnostic challenges. There are still difficulties in making a diagnosis of PJI despite the expansion of the research in this area.¹ Historically, the most popular technique for attempting to make a preoperative PJI diagnosis has been image-guided prosthetic synovial joint fluid aspiration (SA). This has varying success rates, though, with up to 32% of treatments failing to collect enough fluid for examination.² As a result, the goal of this study was to assess how joint aspiration and synovial fluid culture may be used before re-implantation in patients who already had cement spacers in their joints.

An observational research was done in the past. All patients who underwent a two-stage revision surgery were examined for the research. The first procedure in two-stage arthroplasty exchange process involved removing the prosthesis together with all of the cement and forage implants. A thorough debridement was done, and the microbiological lab collected and examined 5-7 samples. The next step involved inserting a prefabricated cement spacer that was filled with the antibiotics (vancomycin and gentamicin). Following the isolation of the responsible bacteria, antibiotic treatment was adapted to the organism's sensitivity. Then, for the next 6 to 8 weeks, same antibiotic therapy was continued. After 2 weeks without antibiotics, synovial fluid was cultured. These cultures' outcomes were noted and contrasted with cultures acquired during the re-implantation procedure.

50 patients with PJI who underwent two-stage arthroplasty revision surgery were studied in total. The synovial fluid culture was unfavourable in 39 cases. Due to dry tap in the remaining 2 cases, both knee spacers, analysis was not feasible. During re-implantation surgery, five patients had two or more intraoperative cultures that were positive (Table 1). Only one patient, number 3 had an ongoing infection. Prior to the second stage of surgery in this patient, the synovial fluid culture was unable to detect the infection. The synovial fluid was negative in each of the other 4 instances, which all suffered a reinfection. After the second stage, three of these five patients (60%) needed further procedures, and in two cases (40%) it was because of an infection (patients 1 and 2).

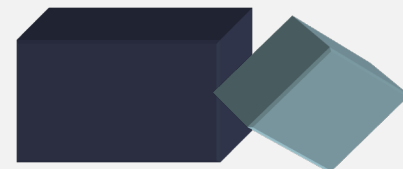


Table 1: Patients with more than two intraoperative cultures positive during second-stage surgery

Patient	Microorg. 1st stage	Spacer joint aspiration	Microorg. 2nd stage	Reinfection/Persistence	Reoperation after 2nd stage	Microorg. reoperation
1	Negative	Negative	<i>S. epidermidis</i> ; <i>S. capitis</i>	Reinfection	Yes (Multiple)	<i>Klebsiella spp</i>
2	Negative	Negative	<i>S. epidermidis</i> ; <i>S. colmii</i>	Reinfection	Yes (Debridement)	Negative
3	<i>S. epidermidis</i> ; <i>S. lugdunensis</i>	Negative	<i>S. epidermidis</i>	Persistence	No	-
4	Negative	Negative	<i>S. epidermidis</i> ; <i>S. haemolyticus</i>	Reinfection	Yes (Periprosthetic fracture)	-
5	Negative	Negative	<i>S. epidermidis</i> ; <i>C acnes</i>	Reinfection	No	-

The distinctions in the aspiration techniques for the knee and hip joints should be emphasised. Since the knee joint is more easily accessible and does not need to be guided by fluoroscopy or ultrasound technology, knee joint aspiration is a considerably simpler process. In certain facilities, sterile saline is injected into the joint and subsequently aspirated to acquire fluid for analysis if no fluid is retrieved following joint aspiration. The 2018 International Consensus Meeting on Musculoskeletal Infection did not advocate injecting saline solution into a joint that has no synovial fluid (dry tap).³ A threshold of 2800 leucocytes/mm³ in synovial fluid has been suggested by Streck LE et al to predict PSI. Targeted antibiotic treatment is possible thanks to the remarkable specificity of microbiological culture. Joint aspiration is a crucial component in the diagnosis of PSI.⁴

The study found evidence to support requiring joint aspiration prior to re-implantation in patients with cement spacers, despite the fact that synovial fluid culture may be valuable in revealing the joint's infection state.

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A Case Report for the Treatment of a Rare Solitary Metastasis Shaft of the Humerus with Pathological Fracture Using Intercalary Resection and Nail Cement Implantation

The third most common nonvertebral fracture in those over the age of 64, following femoral neck and distal radius fractures, are humerus fractures (HFs), which account for around 5.7% of all adult bone fracture occurrences.¹ The current gold standard treatment for disseminated illness that has no contraindications is osteosynthesis. In light of findings that were comparable, there has been controversy regarding intramedullary nailing and osteosynthesis.²

Case Presentation:

After a minor fall, a 70-year-old man who worked from home came with significant discomfort in his right arm. He complained of edoema and stiffness in the surrounding joints. He could move his fingers, shoulder, and elbow with discomfort and effort, but there was no visible damage. A straightforward radiograph of the afflicted limb was used to examine him. It revealed an osteolytic lesion around the pathological fracture across the humeral shaft (Figs 1 and 2). Over the whole humerus, there was severe osteoporosis. To seek for evidence of the main lesion and metastatic lesions, the patient had examinations with a PET scan, a USG thyroid, a CT of the chest, abdomen, and pelvis, and occult blood in the stool. Breast, prostate, thyroid, and adrenal lesions were absent, and the CECT abdomen was normal. In order to eliminate out gastrointestinal/respiratory tract primary, onco-orthopedicians later recommended and performed a bone and soft tissue biopsy that revealed atypical epithelial cell malignancy.

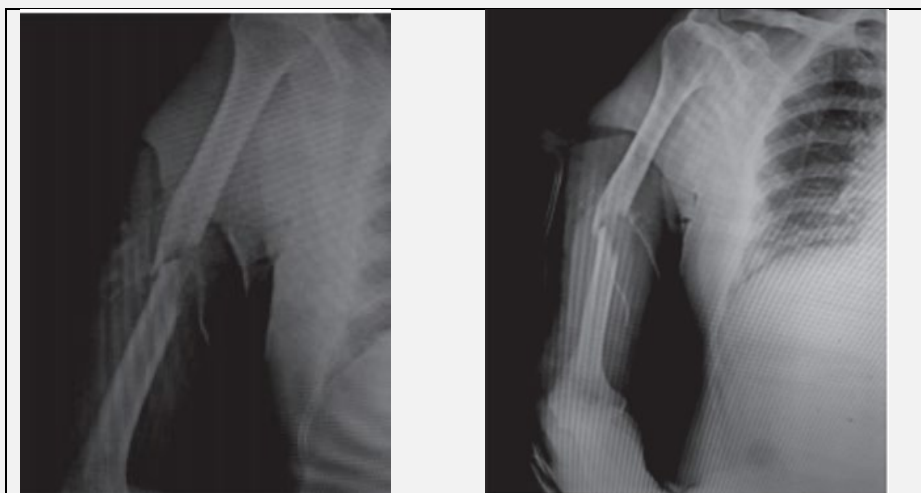
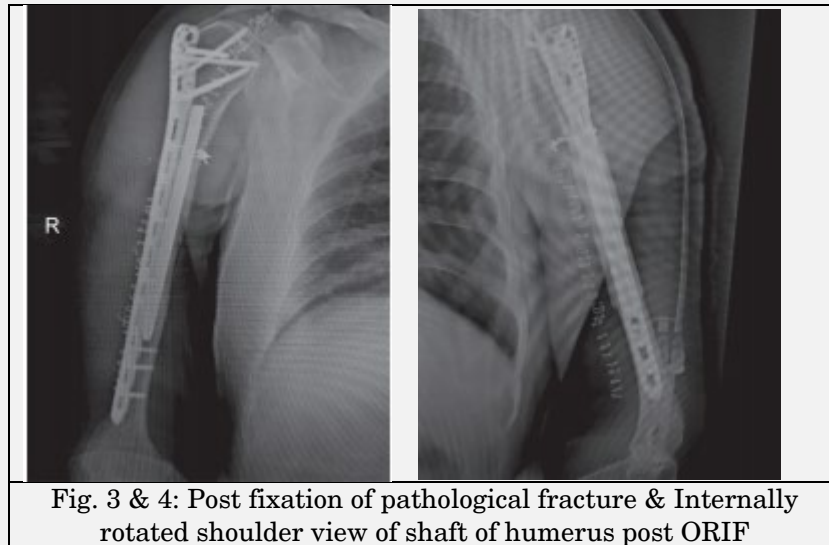


Fig 1 & 2: AP view humerus showing fracture at shaft & AP view of internal rotated shoulder showing pathological fracture shaft of humerus

The onco-orthopedic surgeon had planned a technique that would entail debulking the tumour, filling the area with cement mantle held by a nail, and fixing the humerus shaft to stabilise the fracture (Fig. 3). Following tumour removal and open reduction internal fixation with locking compression long PHILLOS plates, we completed the procedure one week after the biopsy and filled the empty area with

K-nail cement mantle. In the six-month postoperative period, it was discovered that the incorporation of the implants and nails was good (Fig 4).



The spine, pelvis, and long bones are frequent sites for metastasis. The humerus is the second-most prevalent long bone of those. Two accepted indicators of imminent pathological fracture exist. Using Harrington's and Mirel's criteria, a fracture can be temporarily fixed if its grade is greater.² According to a research by Ismat A. et al., effective coating methods can lessen the burden of therapy and be linked to positive outcomes.³

The therapy of this group of patients requires a comprehensive approach. The first requirement for the treating orthopedician is proper identification of the diseased situation. For the patient's survival or to lessen the severity of the condition, treatment of the original tumour should be given top priority. A substantial level of competence is required for effective care and reconstruction techniques if a tumour is discovered. The use of a nail cement spacer with a long PHILOS appears to be a viable treatment for these humeral shaft metastases.

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