

ORTHO NEWSCAST



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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

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3. A total hip replacement patient's pelvic characteristics and sagittal spinal alignment have changed
4. Following a two-stage hip revision with a fasciotomy, pseudoneurysm

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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Limited

Treatment of scaphoid fractures and pseudarthroses with the human allogeneic cortical bone screw

The complicated carpal structure and stability depend heavily on the scaphoid bone, which has cartilage covering up to 80% of its surface. The scaphoid is the carpal bone that fractures the most frequently out of all of them, accounting for about 60% of all fractures. To enhance clinical results, it is crucial to diagnose and treat scaphoid fractures properly.¹ Seldom are allograft bone screws for scaphoid fixation described. When pseudarthrosis is the indication, plates combined with vascularized or non-vascularized bone grafts are the major treatment method. Metal screws are typically utilised to repair fresh fractures. Although the necessity of removing metallic screws is debatable, plates must be removed since the plate restricts movement. According to reports, union rates for scaphoid fracture fixation with biomaterials ranged from 64 to 100%. About 10 weeks after surgery, Brcic demonstrated the integration of an allogeneic cortical bone screw as well as revascularization, sustained osteosynthesis, primary bone healing, and no evidence of immunological rejection. This retrospective study's goal was to examine the union rates and time to union in patients with fresh scaphoid fractures and pseudoarthroses after employing an allogenic cortical bone implant (Shark Screw®).² (Fig.1)

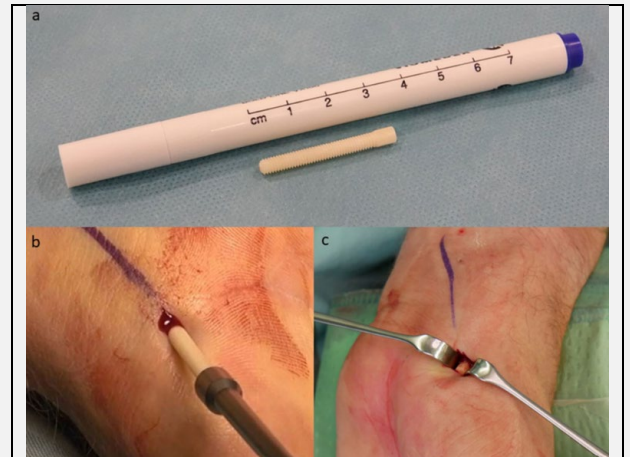


Fig.1: Bone screw and surgical procedure.

75 individuals were retrospectively examined in this study, 44 of whom had pseudoarthrosis and 31 had new fractures. For patients with new fractures and pseudoarthrosis, the Shark Screw® was used to fixate the scaphoid. The union rate, complication rate, and time to union were all assessed in the study.

There was a high union rate (94–96%) while fixing scaphoid fractures with human allogeneic cortical bone screws. Among the groups with newly fractured bones and pseudoarthrosis, there were two nonunions each. 1.3% of cases were complicated (1 patient). The average time to union for patients with acute fractures, pseudoarthrosis, and delayed unions was 16, 18, and 29 weeks, respectively. It uses a quicker, less intrusive surgical procedure without the need for hardware removal, has a low complication rate, and results in union rates that are comparable to those reported in the literature for the treatment of fresh scaphoid fractures and pseudoarthroses.

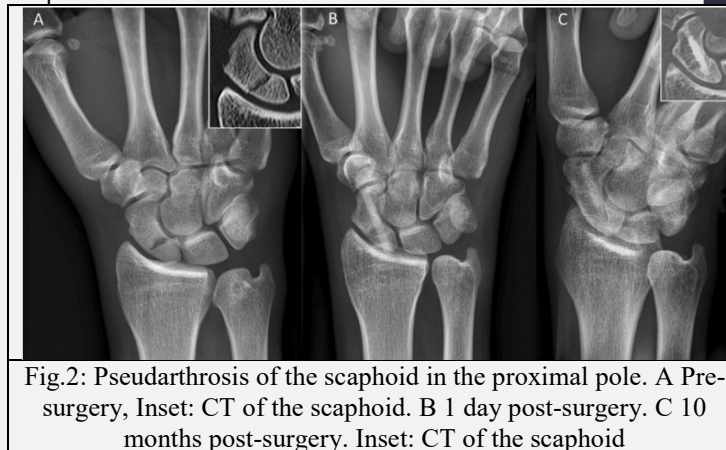


Fig.2: Pseudarthrosis of the scaphoid in the proximal pole. A Pre-surgery, Inset: CT of the scaphoid. B 1 day post-surgery. C 10 months post-surgery. Inset: CT of the scaphoid

The most significant finding of this retrospective study is that after several months, the human allogeneic cortical bone screw completely integrates into the host bone. The use of the human allogeneic cortical bone screw for fixation also showed a high union rate (94–96%), particularly in patients with pseudoarthrosis (96%). Due to non-compliance and inadequate fracture gap bridging, there were two nonunions in the pseudoarthrosis patients (4%). (Fig. 3) According to Pinder et al., the pseudoarthrosis group's median time to union was 18 weeks. Because patients skipped follow-up visits and union could only be documented after the pandemic limitations were lifted, which was well after the typical time to union, the coronavirus pandemic caused the mean time to union in the study under consideration to be prolonged. The high percentage of patients (17%) who have a classification of D2 or above and exhibit a protracted duration to union may be another contributing factor. This is in accordance with Higgins and others.³



Fig.3: Example of nonunion. The patient had pseudarthrosis of the scaphoid in the middle third. A Pre-surgery. B 6 weeks post-surgery. The screw was not placed deep enough into the proximal pole. C 16 months post-surgery. The screw was fully integrated in the bone, but union was not achieved. Re-operation is scheduled

In comparison to other scaphoid fracture fixation techniques described in the literature, using the human allogeneic cortical bone screw (Shark Screw®) resulted in similar union rates in fresh fractures but better union rates in patients with pseudoarthrosis. It also allowed for a quick and minimally invasive procedure without donor site morbidity or the need for a second surgery to remove the hardware. The patient group with pseudoarthrosis shown a very substantial benefit from this novel therapy. The cortical bone screw is remodelled without leaving scars by physiological bone metabolism.

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Postoperative Sciatic Nerve Palsy Risk After Posterior Acetabular Fracture Fixation

In 2%–16% of acetabular fracture surgeries, postoperative sciatic nerve paralysis develops, and in up to 24%–55% of patients, there is no long-term recovery. Few research have examined the significance of intraoperative patient posture, despite the fact that previous studies have identified risk factors for postoperative sciatic nerve palsy.¹ Either the prone position or the lateral position can be used to execute the Kocher-Langenbeck technique for posterior acetabular fractures. Whatever position is chosen typically depends on the patient's body habit, the type of fracture, and the surgeon's preference. In order to (1) ascertain the prevalence of postoperative sciatic nerve palsy by position and (2) describe risk variables for postoperative sciatic nerve palsy, this study performed a thorough retrospective cohort analysis of acetabular fractures treated in the prone and lateral positions.²

To find patients who had a posterior approach for acetabular fixation, electronic medical records from three Level I academic trauma hospitals were searched. The prevalence of postoperative sciatic nerve palsy by position was the main result. The secondary outcomes were propensity scoring and multiple regression analysis of nerve palsy risk variables.

In the prone position, the rate of postoperative sciatic nerve palsy was 9.5% (43/455) and in the lateral position, it was 1.5% (9/590). ($P < 0.001$). Patients who experienced a postoperative sciatic nerve palsy had considerably higher intraoperative blood loss and longer surgical times. A subgroup analysis revealed that in posterior wall fractures, location had no bearing on the occurrence of palsy. Propensity score analysis revealed a substantially higher odds ratio of palsy in the prone position [aOR 7.14 (2.22-23.00); $P = 0.001$] for other fracture types. (Table 1)

	OR (95% CI)	P
Posterior wall only (PW)		
Surgical duration (min)	1.02 (1.00-1.04)	0.029
Non-PW		
Prone (vs. Lateral)	8.33 (2.33-25)	0.001
EBL (mL)	1.00 (1.00-1.00)	0.027
Additional approach required (yes)	0.18 (0.04-0.92)	0.039

With acetabular fractures treated with a posterior approach and positioned prone as opposed to lateral, there was a considerably higher rate of post-operative sciatic nerve palsy (9.5% vs. 1.5%, $P < 0.001$). In addition, there was a substantially different prevalence of chronic motor palsy in the prone-positioned group (3.1% vs. 0.3%, $P = 0.001$). In contrast to previously reported results, the use of a second anterior approach appeared to be inversely related to the risk of nerve palsy.³ Simske et al. did not evaluate risk based on intraoperative patient position when analysing risk variables for traumatic and iatrogenic nerve palsy (including the sciatic and other nerves).³ This study has a number of advantages. This multicenter study compares patient placement in posteriorly treated acetabular fractures and has nearly ten times the sample size of any other study in this area. As a result, it is capable of detecting a real, substantial difference in the incidence of postoperative palsy.²

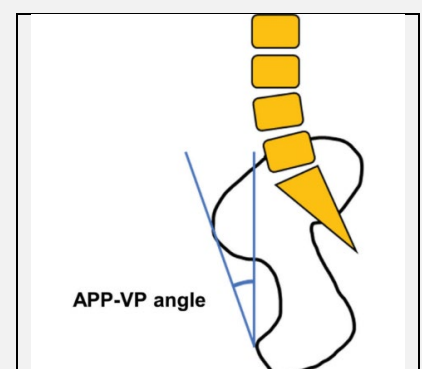
The findings of this study suggest that fractures treated in the prone position, increased blood loss, and prolonged operative duration are factors associated with increased risk for postoperative sciatic nerve palsy following a posterior approach, with the exception of posterior wall fracture patterns. While deciding on surgical location, these risks should be taken into account together with the other objectives (such quality reduction) of acetabular fracture surgery.

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A total hip replacement patient's pelvic characteristics and sagittal spinal alignment have changed

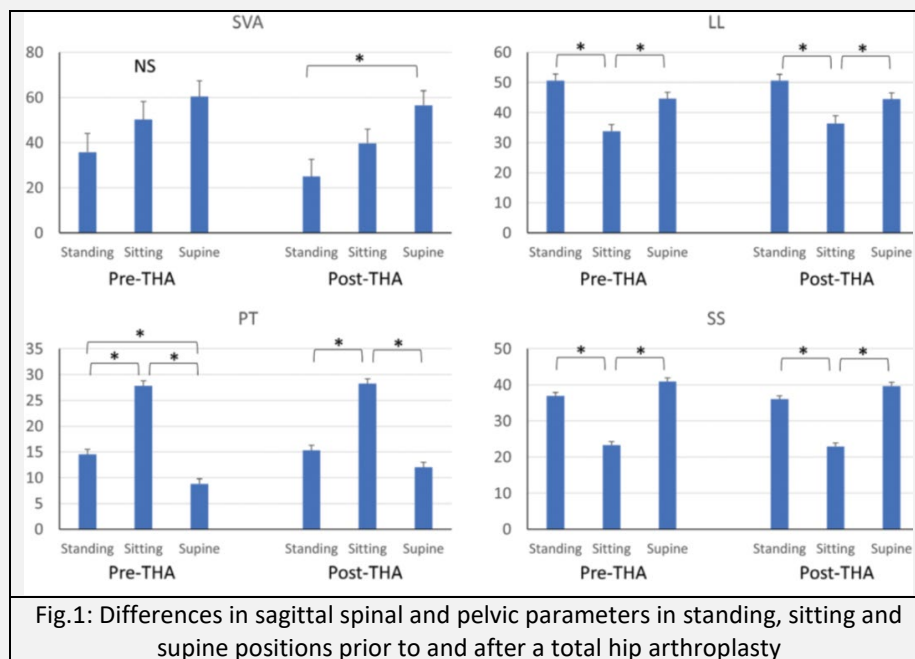
Throughout the past few decades, significant advancements have been made in the radiographic assessment of the sagittal spinopelvic alignment. Many investigations have shown that individuals with degenerative lumbar illness adopt posterior pelvic tilt to make up for lost lumbar lordosis and keep their posture upright.¹ Many studies have been done on the connection between the spine and the pelvis. Unfortunately, nothing is known about how the hip joint keeps the sagittal equilibrium. The radiographic sagittal spine and pelvic



parameters were examined before and after total hip arthroplasty (THA), and the effects of posture in the standing, sitting, and supine postures were also assessed.²

In patients receiving a unilateral THA, 36-inch anteroposterior and lateral standing, sitting, and supine radiographs were taken both before and after the THA. Measurements were made on standard pelvic and spinal alignment criteria.

Thirty-one patients had complete radiography data. Sagittal vertical axis (SVA) decreased from 35.7mm before the THA to 24.9mm afterward. Lumbar lordosis was 50.6° when standing and 33.8° while sitting; it remained at 50.6° while standing and 36.4° while sitting after THA. Pelvic incidence (49.1° to 51.2°) was constant in all positions before and after THA. Sacral slope before THA was 36.9° while standing, 23.3° while seated, and 40.9° while supine. This was kept (36.0° standing, 22.9° sitting, and 39.7° supine) after the THA. Pre-THA, the pelvic tilt was 14.5° while standing, 27.8° while seated, and 8.8° while recumbent. This (15.3° standing, 28.2° sitting, and 12.0° supine) was maintained after the THA. The pelvis slides posteriorly as a patient assumes a seated posture, as seen by the much lower lumbar lordosis and significantly higher pelvic tilt in the sitting position compared to the standing and supine positions. (Fig.1)



This study presented two key findings. Initially, the study looked at individuals with degenerative lumbar disease and hip pathology who needed a THA to see if a THA altered compensatory mechanisms of spinopelvic alignment. Between pre- and post-THA, there were no discernible differences in any spinopelvic measures. This demonstrates that processes, whereby pelvic retroversion compensated for LL loss, were preserved following a THA. Second, the study contrasted spinopelvic measures in pre- and post-THA standing, sitting, and supine positions. Between the postures, there was a substantial difference in pelvic orientation. The pelvis was significantly more retroverted in the sitting position and

had less LL, whereas it was least retroverted in the supine position. In the sitting position, this was demonstrated by larger PT and APP-VP and smaller SS and LL. Perhaps changing An increase in total hip arthroplasty dislocations in patients who had previously undergone spinal fusion may be attributed to these alterations in alignment. Patients with fixed spinopelvic alignment from the standing to the sitting position had a higher risk of hip dislocation, according to research by Esposito CI et al. Using this technique, imaging patients in a standing and sitting posture can give important insight into whether a patient has a fixed spinopelvic alignment with postural alterations and is hence more susceptible to dislocation.

For patients having THA, this research establishes baseline values for the typical standing, sitting, and supine sagittal spine and pelvic parameters. The radiological characteristics of the sagittal spine and pelvis do not appear to change significantly after THA.

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Following a two-stage hip revision with a fasciotomy, pseudoneurysm

One of the most popular elective surgeries is primary total hip arthroplasty (THA). As the frequency of these procedures rises, it's critical to recognise potential complications and put risk-reduction measures in place.¹ Blood that accumulates between the tunica media and the tunica adventitia, the blood vessels' outermost two layers, is known as a pseudoaneurysm. This condition is frequently brought on by persistent blood vessel wall degradation.² In the study, a patient who had periprosthetic joint infection and hematoma symptoms was described. Returning to the operation theatre for the removal of the hematoma revealed a pseudoaneurysm but no overt indications of joint infection. Hence, this study demonstrates the importance of considering a pseudoaneurysm in the setting of hematoma and periprosthetic joint infection.³

A 70-year-old male with a history of right THA after having his capital femoral epiphysis slip 56 years earlier. Several dislocations and persistent prosthetic joint infections later worsened the right hip primary arthroplasty. Debridement, antibiotics, and implant retention (DAIR) were used to treat the most current infection. Then, the patient complained of right thigh soreness. He was identified as having

Fig.1: Preoperative anteroposterior X-ray of the right hip.



periprosthetic joint infection caused by *Streptococcus bovis* after additional examination. (Fig.1) The hip was revised in two stages utilising an antibiotic spacer on the patient. He presented with a sudden onset of uncontrolled atrial fibrillation, quick ventricular response, and poor haemoglobin two weeks after the second stage. The computed tomography scan showed a significant hematoma covering the anterior and posterior compartments of the thigh, along with lab markers that raised doubts about an infection. No purulence was identified after the hematoma was removed, but a sizable pulsatile pseudoaneurysm was discovered on the posterolateral part of the mid-femur. The pseudoaneurysm was found next to a pointy bone piece. A vascular surgeon corrected the pseudoaneurysm and extracted the bone fragment. Six weeks after the pseudoaneurysm repair, the patient required a double DAIR operation for a periprosthetic joint infection and is currently on chronic antibiotic suppression.

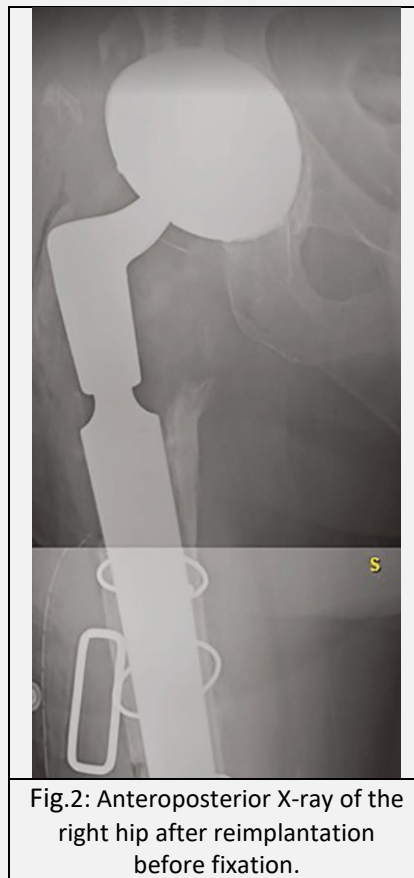


Fig.2: Anteroposterior X-ray of the right hip after reimplantation before fixation.

A rare side effect of THA is the development of pseudoaneurysms. Even though it is uncommon, it occurs more frequently in the revision setting than in the primary THA context. The majority of instances that have been documented present similarly, with a quiescent period of a few weeks to 15 years followed by an abrupt start of discomfort, thigh edoema, a considerable reduction in haemoglobin, and cardiac instability. The most frequently documented causes of pseudoaneurysms in THA are cement spicules and incorrect retractor positioning. 4 First-line diagnostic imaging using ultrasonography is advised if a pseudoaneurysm is suspected. This non-invasive, affordable, and sensitive screening instrument can be utilised to see the deep soft tissue vasculature. For the diagnosis of pseudoaneurysms, duplex ultrasound has a sensitivity of up to 94%.



Orthopedic surgeons who treat a postsurgical hematoma with abrupt onset should be mindful of the possibility of pseudoaneurysm in the context of total joint arthroplasty.

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