

# Simultaneous bilateral arthroplasty of the hip by anterior approach. A case report

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Case report

Orthopedic Surgery



**Background:** It is estimated that of all patients requiring total hip arthroplasty (THA), 15% to 20% are candidates for bilateral procedures, and full and satisfactory function may not be fully recovered until both hips undergo the procedure surgical. We present the case of a 56-year-old patient with right coxalgia of 5 years' evolution, who underwent bilateral THA with an anterior approach. The advantages and perioperative and postoperative complications were discussed. The hospital stay was 2 days, the total blood loss was 500 ml; walking without support began at 4 weeks. One-stage bilateral THA has complication rates similar to unilateral total hip arthroplasty, so it is considered a safe procedure that reduces hospital stay, is more cost-effective, and allows earlier rehabilitation in appropriately selected patients. Informed consent was obtained from the patient and the approval of the ethics committee of Hospital General Xoco.

**Keywords:** Coxofemoral joint, arthroplasty, coxalgia, coxarthrosis, prosthesis.

Total hip arthroplasty (THA) is the most successful and effective intervention to treat degenerative hip diseases (1,2). It is roughly estimated that of patients requiring total hip arthroplasty, 15% to 20% are considered for a bilateral procedure, and satisfactory function may not be fully recovered until both hips undergo the surgical procedure (3). One-stage simultaneous bilateral THA was initially proposed in 1971 by Jaffe and Charnley, since then several studies have reported the positive outcome of simultaneous bilateral THA (4).

In addition, bilateral THA has been reported to have similar complication rates as unilateral total hip arthroplasty and could be a safe procedure in appropriately selected patients (2). Sequential bilateral THA has several benefits compared to those performed in two surgical stages, it is more cost-effective, it reduces hospital stay, a single anesthetic event is required and an earlier return to daily activities (5,6). Many reports have shown the safety of sequential bilateral total hip arthroplasty in low-risk patients; that is, with disease category 1 or 2 of the American Society of Anesthesiologists (ASA), (7,8).

It is important to mention that with the direct anterior approach for total hip arthroplasty, a faster postoperative recovery is achieved, and it has a lower rate of complications compared to other approaches (9) since throughout the procedure, the patient is in a supine position (10), which could save operative time, and does not require a repositioning during a sequential bilateral total hip arthroplasty.

The objective of this report is to present the first case of simultaneous bilateral total hip arthroplasty with an anterior approach successfully performed in Latin America.

## Case report

A 56-year-old woman who began her condition 5 years ago with disabling pain in her right hip (VAS 7/10) and 2 years ago with progressive pain in her left hip. The patient attended the hip and pelvis surgery service of the Xoco General Hospital in Mexico City in March 2021. On physical examination, it was observed that the left pelvic limb had decreased ranges of motion with 70° of flexion, 5° of extension, 5° of internal rotation and 20° of external rotation; knee, ankle, and foot range of motion were preserved, with preserved sensitivity, 2/3 ROT present, 3/4 muscle strength due to severe coxalgia, distal pulses present, and 2-second capillary refill. In the right pelvic limb, decreased mobility arcs were observed with flexion of 85°, extension of 5°, internal rotation of 15° and external rotation of 40°; knee, ankle, and foot ranges of motion preserved, sensitivity preserved, 2/3 ROT present, 3/4 muscle strength due to severe coxalgia, distal pulses present, and 2-second capillary refill. Harris Hip Score with a score of 44 and a HAAS with a score of 7.

Diagnosis: 1) Right coxarthrosis grade IV, mechanical, atrophic, concentric and hypomobile. 2) Grade IV left coxarthrosis, mechanical, atrophic, superolateral hypomobile.

Laboratory studies: Leukocytes 8.4, Hemoglobin 15.3 mg/dl, Hct 44.6, Platelets 393,000, PT 10.1, TTP 33.3, Glucose 232 mg/dl, Creatinine 0.6, Sodium 138, Potassium 4.7. The electrocardiogram showed sinus rhythm, normal axis, without data of ischemia, injury or necrosis. He was assigned a surgical risk of ASA II, Goldman I, Caprini high risk, and Ariscat low risk for pulmonary complications.

Imaging studies: Simple x-ray of the anteroposterior (AP) bone pelvis, with a marked decrease in joint space, the presence of bilateral marginal osteophytes and marked subchondral sclerosis (Figure 1).

### Treatment and surgical technique

Once the clinical status of the patient had been analyzed and with her informed consent, surgical treatment was decided, a total bilateral hip arthroplasty was performed at the same surgical time, with an uncemented technique via the anterior approach. The arthroplasty was performed with two simultaneous surgical teams. For the approach to the right hip, the anterosuperior iliac spine and the greater trochanter were taken as anatomical references. An oblique incision was made 2-4 cm distal and lateral to the iliac spine, anterosuperior to the region anterior to the greater trochanter. With deep dissection the fascia of the tensor fascia lata was exposed and incised along its fibers, and with blunt dissection the medial fascia was dissected, until a space was obtained between the sartorius and the tensor fascia lata. The ascending branch of the lateral femoral circumflex artery and vein was identified and cauterized at the intertrochanteric line. Once the anterior capsule of the hip was exposed, the femoral neck osteotomy was performed. The acetabular component was worked down to the acetabular fundus and placed in a 45-degree tilt and 15 degree anteversion position bilaterally for each acetabular component. Femoral exposure was performed by external rotation of the femur beyond 90 degrees and a proximal femoral hook was placed to elevate the proximal femur and facilitate exposure. Leg position and length were assessed at this point in the procedure prior to final implant placement. The same procedure was followed on the left hip, however, due to its superolateral osteoarthritic pathophysiology, an acetabuloplasty with a shelf-type head graft was performed when working on the acetabulum. At the time of placing both acetabular components, height and depth were guided by fluoroscopy. Finally, wound closure with capsule repair was initiated, followed by closure of the tensor fascia lata with interrupted cross suture. The subcutaneous tissue was closed with an absorbable suture and the skin was stapled. The surgical procedure was performed with neuraxial anesthetic

block, lasting approximately 2 hours and a half and bleeding of 500 ml.

### Prosthesis

The prosthesis was placed in the right hip, with a 54mm Versafitcup CC Trio acetabular component, E liner, and a Quadra-H number 3 femoral component with a 36mm CoCr-Polyethylene head. A 56 mm Versafitcup CC Trio acetabular component, liner F, and a Quadra-H femoral component number 3 with a 6 with a 36 mm CoCr-Polyethylene head (Medacta, Castel San Pietro, Switzerland) were placed in the left hip.

### Post-surgical Evolution

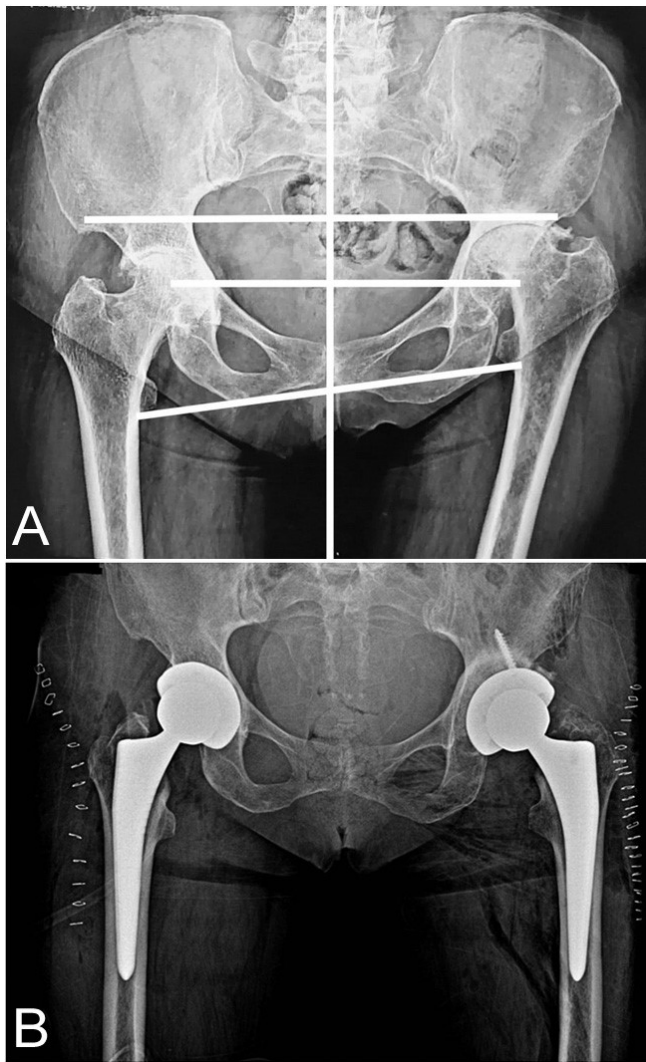
After two days of hospital stay and 4 weeks of evolution, the patient was reported without coxalgia, with plantigrade gait, bipedalism, without claudication and with well-healed wounds without the presence of fistulas or dehiscences. In both pelvic limbs, a decrease in the range of motion was observed with flexion of 110°, extension of 10°, internal rotation of 30° and external rotation of 70°; knee, ankle, and foot ranges of motion preserved, with preserved sensitivity, 2/3 ROT present, 3/4 muscle strength due to severe coxalgia, distal pulses present, and 2-second capillary refill. A Harris Hip Score was performed giving a score of 98, and a HAAS with a score of 14.

### Discussion

Bilateral total hip arthroplasty was first described in 1971 by Jaffe and Charnley (4); however, the safety of this procedure remains a major concern, especially mortality rates. However, several studies indicate that there are no significant differences in mortality between simultaneous bilateral total hip arthroplasty and staged total hip arthroplasty, the frequency of mortality largely depending on the age of the patients (11).

On the other hand, it is difficult to determine which patients should undergo simultaneous bilateral THA due to the incidence of intraoperative and postoperative complications. One of the most frequent intraoperative complications is blood loss, in the case presented it was 500 ml, which we consider favorable for bilateral total hip arthroplasty if we consider what has been reported in previous studies, where a mean total loss of 926.4 ml in bilateral total hip arthroplasty and 489 ml in those performed in stages (12,13).

A prolonged surgical procedure contributes to increased blood loss, contributing to the appearance of Virchow's triad and causing venous thromboembolism (14). Furthermore, it has been shown that the greatest aggression, as one of the causes of venous



**Figure 1.** A. Anteroposterior pelvic radiograph of the pre-surgical, where bilateral wear of the hip can be observed, on the right side was observed sclerosis, osteophytes, and decreased joint space can be observed on the left side with superior migration and wear of the acetabular roof, osteophytes, and loss of the center of rotation. B. Post-surgical control radiograph, showing both hips with proper placement of the prosthesis and restoration of the centers of rotation, with bone graft in the left hip and decreased center of rotation.

thromboembolic disease, occurs during the insertion of the femoral component. Therefore, simultaneous bilateral total hip arthroplasty is expected to double the risk of thromboembolic events. These results can be used to improve perioperative venous thromboembolic prophylaxis and early mobilization of patients in the intensive care unit, as well as to develop hypotensive anesthesia and modern cementation techniques (15).

Regarding bleeding, it has been observed that with the use of tranexamic acid and anatomical dissection, as well as the ligation of the ascending branch of the anterior circumflex in the direct anterior approach, there is better control of hemostasis (16). On the other hand, events such as blood loss, surgical time, and prolonged hospital stay are known to favor post-surgical complications (17). However, some studies have described the results of simultaneous

bilateral THA, comparing a series of 978 patients who underwent simultaneous bilateral sequential THA with 1666 patients who underwent unilateral THA, without finding significant differences between both groups on postoperative complications (18,19).

Interestingly, simultaneous bilateral total hip arthroplasty was associated with fewer respiratory complications (3).

Similarly, simultaneous bilateral total hip arthroplasty was associated with a reduction in the occurrence of deep vein thrombosis and pulmonary embolism compared with staged bilateral total hip arthroplasty, but with no statistically significant difference in thromboembolic event rates (20). The same is true for complications of the cardiovascular or digestive system. However, there are some conflicting studies, one of them reporting a higher incidence of cardiovascular complications in the simultaneous bilateral total hip arthroplasty group than in the staged bilateral total hip arthroplasty group (7) and the other reports a higher incidence of cardiovascular and digestive system complications in the staged bilateral total hip arthroplasty group (21).

The occurrence of dislocation and infection as post-surgical complications has been reported without significant differences between the groups of simultaneous bilateral total hip arthroplasty and staged bilateral total hip arthroplasty (22).

Finally, early rehabilitation of patients helps reduce hospital costs. Currently, performing simultaneous bilateral THAs in bilaterally symptomatic patients reduced medical costs by 20% (12).

## Conclusion

In conclusion, bilateral simultaneous THA is favorable compared to staged THA in terms of results, complications, and feasibility. If bilateral minimally invasive THA is performed simultaneously, it is a good option in terms of low complication rates and cost-benefit for both the patient and the institution. Therefore, our report is one of the first cases in Latin America of a sequential bilateral total hip arthroplasty through a minimally invasive anterior approach that is safe to perform.

## Conflicts of interests

The authors declare that they have no conflicts of interest.

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