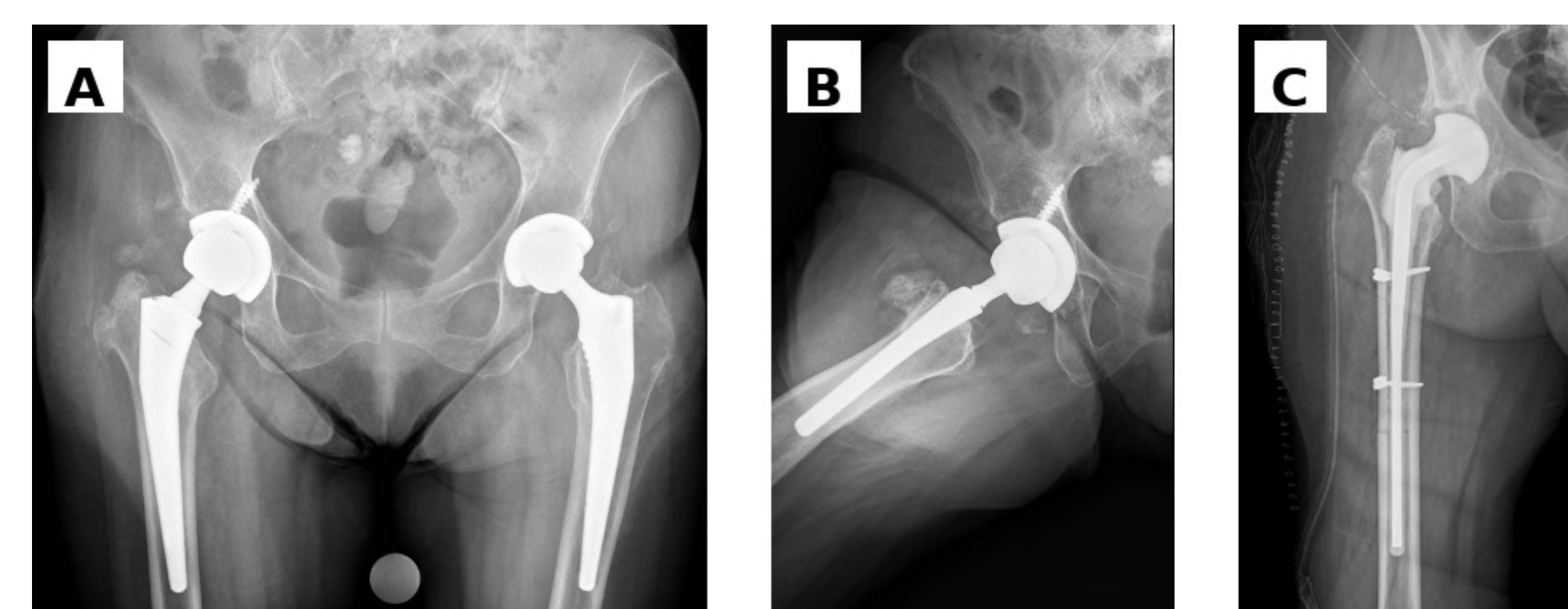


Extended Trochanteric Osteotomy in Two-Stage Revision for Chronic Periprosthetic Hip Infection: Safety, Union, and Infection Control

A. Sambri, A. Bruschi, C. Rondinella, R. Zucchini, L. Di Prinzio, A. Pace, and M. De Paolis

Orthopedic Unit, IRCCS Azienda Ospedaliera Universitaria di Bologna, Italy

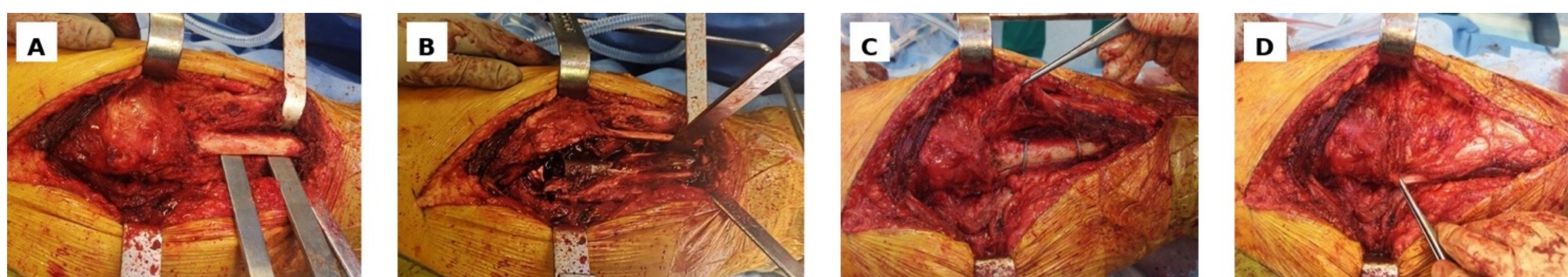
Periprosthetic joint infection (PJI) after total hip arthroplasty is a challenging complication associated with substantial morbidity and increasing revision burden. Two-stage exchange remains a standard treatment for chronic PJI, requiring complete implant removal and thorough debridement. Extraction of well-fixed femoral stems may cause fractures, cortical perforation, and bone loss. Extended Trochanteric Osteotomy (ETO) facilitates controlled stem removal and intramedullary debridement, but concerns remain regarding healing and infection recurrence in septic settings. This study evaluated the **safety and efficacy of ETO during first-stage revision for chronic hip PJI**, focusing on complications, osteotomy union, infection eradication, and functional outcomes compared with cases managed without ETO.



Radiographic evaluation of a patient undergoing revision surgery with extended trochanteric osteotomy (ETO). (A) Preoperative anteroposterior radiograph of the pelvis showing bilateral total hip arthroplasties. (B) Preoperative lateral radiograph of the affected hip. (C) Postoperative radiograph demonstrating placement of a premolded antibiotic spacer with a long femoral stem and fixation of the extended trochanteric osteotomy using cerclage wires.

METHODS

This retrospective, single-center study included adult patients treated for chronic hip PJI at a single Center, between 2020 and 2024. Inclusion criteria were EBJIS-confirmed PJI, indication for two-stage revision with completed first-stage stem explantation, and ≥ 12 months of clinical and radiographic follow-up. Patients with uncontrolled systemic infection, altered femoral anatomy, aseptic loosening, or incomplete data were excluded. During the first stage, radical debridement and femoral stem removal were performed. ETO was selected intraoperatively for well-fixed, osseointegrated stems, while loose or non-osseointegrated implants were removed using standard techniques. Following stem and cement removal, the osteotomy was reduced and stabilized with metallic cerclage cables. Antibiotic-loaded spacers were implanted when indicated, and tissue samples were obtained for microbiological analysis. Reimplantation was performed after clinical and serological normalization.



Intraoperative sequence of the extended trochanteric osteotomy (ETO): (A) creation of the osteotomy; (B) mobilization of the bone flap; (C) fixation with metallic cerclage cables; (D) soft tissue closure.

RESULTS

Fifty-four patients (27 males, 27 females; mean age 69.7 ± 11.4 years) were included. ETO was performed in 35 patients (64.8%), while 19 (35.2%) underwent stem removal without osteotomy. Preoperative radiographic loosening was more frequent in the non-ETO group (31.6% vs. 14.3%; $p = 0.04$). Most stems were uncemented (81.5%), and the mean ETO flap length was 176.0 ± 41.9 mm.

Overall, intraoperative fractures occurred in 13.0% of cases, with no significant difference between ETO and non-ETO groups (11.4% vs. 15.8%; $p > 0.05$). Infection eradication was achieved in 72.2% overall, with no significant difference between ETO and non-ETO groups (77.1% vs. 63.2%; $p = 0.2$). Mean HHS improved significantly from 60.6 to 76.3 ($p = 0.001$), with comparable functional gains between groups. Radiographic union of the ETO was achieved in **94.3% (33/35)**, with two asymptomatic delayed/non-unions requiring no further surgery. Spacer dislocation occurred in 29.4% of spacer cases.

CONCLUSIONS

ETO was required in nearly two-thirds of patients undergoing first-stage revision for chronic hip PJI, particularly in cases with well-fixed stems. Preoperative radiographic loosening and absent early osseointegration were associated with successful standard extraction and may help anticipate the need for ETO. The technique demonstrated excellent biological reliability, with **94.3% osteotomy union**, despite the infected setting. Intraoperative fracture rates were comparable between ETO and non-ETO groups, while infection eradication and functional recovery were also similar. These findings suggest that ETO provides controlled stem removal and extensive intramedullary debridement without compromising healing or infection control. **ETO should therefore be considered a safe and reliable strategy for complex septic hip revisions.**