Management Strategies, Complications and Outcomes of Periprosthetic Fractures around Knee Megaprosthesis

MUHAMMAD KHATIB[1], Mustafa Yassin
[1]Orthopedic

INTRODUCTION:

Megaprostheses, or endoprosthetic replacements , are critical for managing periprosthetic fractures following tumor resection around the knee, enabling limb salvage over amputation.

Being an ideal modality of care for orthopedic oncology, makes the transition from amputation to limb salvage a certainty. Despite the advances in materials and implant designs, megaprosthesis have inherent disadvantages and failures higher than conventional implants, making revision surgery relatively frequent

This study comes to appraise the effectiveness of the treatment of periprosthetic fractures around megaprosthetic implants around the knee. We evaluated the management strategies employed for periprosthetic fractures, and their outcomes. we also evaluated the various approaches to fracture management, including operative and non-operative interventions along with their respective success rates and complications. Additionally, this study proposes a treatment algorithm to guide clinicians facing similar clinical scenarios

METHODS: A retrospective study analysed 36 PPFs in 31 patients (median age 34.5 years) at a UK tertiary institute from 1996 to 2019. We report our experience on PPFs around knee among megaprostheses adolescent's sufferer from tumor and revision surgery. Data included demographics, primary diagnosis, fracture type (Unified Classification System, UCS), implant stability, and risk factors. Outcomes included healing, complications, and amputations

RESULTS: Of 36 periprosthetic fractures, 24 (66.7%) were femoral, and 12 (33.3%) were tibial, with 83.3% involving cemented rotating hinge implants. According to the UCS classification system18 fractures (50%) these fractures were classified as UCS type-B1 cases (50%). Non-operative treatment (25.0%; 6 UCS B1, 3 UCS C) had no failures. Operative treatment (75.0%) had a 44% failure rate 12 of 27, primarily due to infections. The underlying reason for the fractures was as follows: In nine cases (25%), a mechanical reason was identified, while five cases (14%), had a cortical perforation with cement extravasation (figure 1). In three cases the reason was attributed to stem malalignment (Figure 2). Five patients (16.1%) required amputations, all associated with prosthetic joint infections (PJIs)

DISCUSSION AND CONCLUSION:

Management of periprosthetic fractures represents a significant challenge and optimal treatment remains controversial, also because no guidelines available yet.

We believe that managing periprosthetic fractures around endoprostheses requires a more conservative approach than standard implants, and non-operative management carried less risk than surgical intervention.

Attention should be given to the adolescents and young adults patients, were periprosthetic fractures are a big challenge for orthopedic surgeons. Non-operative management of stable, non- and minimally displaced UCS B1 and C fractures showed no failures, suggesting lower risk than operative interventions (44% failure rate, 42.0% amputation rate in failures)

Owing to the limited salvage options following surgery due to the high rate of typical intraoperative and postoperative complications, we suggest to look outside the box, and to evaluate other managements strategies, even non-operational interventions