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Title

Periprosthetic Fractures Among Patients with Osseointegration Prosthesis: A Retrospective Review of 518 Cases

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Summary

This article is the first to directly address the incidence, risk factors, and management of periprosthetic fractures after osseointegration.

Introduction/ basics

Patients with skeletally anchored (osseointegrated) prostheses have increased prosthetic use and quality of life versus those with traditional socket prostheses. Support for osseointegration has been impeded by concerns regarding infection and potential periprosthetic fracture.

Material method; implementation/ process

A retrospective review identified 518 osseointegration procedures with complete records between 2010 and 2018. Potential risk factors evaluated included FRAX risks, time from amputation to osseointegration, age at osseointegration, uni/bilateral implantation, weight, and gender. Risks were evaluated with multiple logistic regression. Injury mechanism, fracture stabilization technique, pre-osseointegration and post-fracture mobility (K level), and prosthesis wear were also assessed.

Results

22 periprosthetic fractures occurred, exclusively in the femur (22/518=4.2% of all osseointegration surgeries, 22/347=6.3% of all implanted femurs): 2 femoral neck, 14 intertrochanteric, and 6 subtrochanteric. 19/22 were within 2 cm of the proximal implant tip and also 19/22 were the result of a ground level fall. No spontaneous fractures occurred. Dynamic hip screw (10) and reconstruction plate (9) were the most common fracture reconstruction implants. No osseointegration implants required removal, no patients declined K level, and all patients retained K level 2 or higher compared to only 5/22 (22.7%) before osseointegration.

21/22 patients (95.5%) currently wear their osseointegration prosthesis longer daily than they wore their socket, with 18/22 (81.8%) wearing it >16 hours/day. Regression analysis identified a 3.894-fold increased fracture risk for females ($p=0.007$) and a 1.0237-fold increased fracture risk per kg ($p=.046$). Bilateral implants did not reach statistical significance for increased risk ($p=0.083$) and neither did time from amputation to osseointegration ($p=0.974$) nor age at osseointegration ($p = 0.331$).

Discussion/ conclusion; conclusion for the practice

Periprosthetic osseointegration fractures are uncommon and can be routinely managed.

Patients retain independence and improved ambulation compared to using a socket prosthesis.

Patient age and time since amputation do not raise fracture risks. Women and obese patients present an increased risk. And although bilateral amputees did not display a significantly higher risk ratio, we encourage high attention in falls prevention during times of prosthesis adjustment.

References

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