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Periprosthetic femoral fracture after total hip replacement: incidence, risk factors and treatment

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten

I. Chatziagorou C, Lindahl H, Garellick G, Kärrholm J. Incidence and demographics of 1751 surgically treated periprosthetic femoral fractures around a primary hip prosthesis. *Hip International.* 2019 May; 29(3): 282-288

II. Chatziagorou C, Lindahl H, Kärrholm J. The design of the cemented stem influences the risk of Vancouver type B fractures, but not of type C: an analysis of 82,837 Lubinus SPII and Exeter Polished stems. *Acta Orthopaedica.* 2019 April; 90(2): 135-142

III. Chatziagorou C, Lindahl H, Kärrholm J. Surgical treatment of Vancouver type B periprosthetic femoral fractures. Patient characteristics and outcomes of 1381 fractures treated in Sweden between 2001 and 2011. *The Bone & Joint Journal.* 2019 November; 101-B: 1447-1468

IV. Chatziagorou C, Lindahl H, Kärrholm J. Lower reoperation rate with locking plates compared with conventional plates in Vancouver type C periprosthetic femoral fractures: A register study of 639 cases in Sweden. *Injury.* 2019 December; 50(12): 2292-2300

SAHLGRENSKA AKADEMIN
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Abstract

This thesis investigates the incidence of surgically treated periprosthetic femoral fractures (PPFF) in Sweden between 2001 and 2011, the demography of this population, risk factors that may contribute to its occurrence and the treatment of these fractures. All four studies in this thesis are observational and are based primarily on material from the Swedish Hip Arthroplasty Register (SHAR) database. This database was linked with data from the National Patient Register (NPR) in two stages and with the Swedish Knee Arthroplasty Register. Data were extracted from both the SHAR database and medical records.

In Paper I, the data link revealed a low registration rate in cases where other treatment methods than femoral stem revision were applied. The incidence of PPFFs increased in Sweden during the study period, with higher incidence in individuals older than 80 years. Paper II showed that the force-closed design of the cemented Exeter stem was a risk factor (HR=9.6) for fractures close to a hip stem (Vancouver type B) when compared with the shape-closed Lubinus SP II cemented stem. Age, gender, diagnosis and calendar year at primary THR also influenced the risk of PPFF. In Paper III. Vancouver type B1 and interprosthetic femoral fractures (IPFF) ran a higher risk of a poor outcome in cases with cemented stem fixation and primary osteoarthritis at the index operation. The type of plate fixation preferred in B1 fractures did not influence the outcome, whereas the choice of ORIF (open reduction and internal fixation) instead of stem revision in B2/B3 fractures resulted in a poorer outcome. Similar re-reoperation rates were recorded for cemented and uncemented modular or monoblock revision stems in the treatment of B2/B3 fractures. Vancouver type C fractures were studied in paper IV. Locking plates had a lower re-reoperation rate within two years of the PPFF, when compared with conventional plates in patients without an ipsilateral knee prosthesis. Within two years of the surgical treatment of a Vancouver type C fracture, 24% of the population had died. The re-reoperation rate for all B and all C fractures was 17.3% and 15.2% respectively (Papers III and IV).

In conclusion, periprosthetic fractures treated with methods other than stem revision had a low registration rate in the SHAR. The incidence of this complication increased in 2001-2011. The cemented Exeter stem involved a 10 times higher risk of Vancouver type B fractures than the Lubinus SP II stem. The presence of an ipsilateral knee prosthesis was a risk factor for poorer outcome in type B but not in type C fractures. The type of plate fixation influenced the outcome of type C and not of type B1 fractures.

Keywords: Periprosthetic fracture, Interprosthetic fracture, Incidence, Risk factors, Treatment, Outcome, Mortality

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