

**High Complication Rate After Percutaneous Screw Fixation for Valgus-Impacted Femoral Neck Fractures Without Sagittal Malalignment**

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**Purpose:** Cancellous screw fixation for valgus-impacted femoral neck fractures has recently been associated with a reoperation rate up to 20% with malalignment in the sagittal plane being a major risk factor for failure in previous studies. The purpose of this investigation was to evaluate the rate of major complications in patients without sagittal plane malalignment who underwent percutaneous screw fixation of a valgus-impacted femoral neck fracture.

**Methods:** A retrospective review was conducted of patients aged >50 years with valgus-impacted femoral neck fractures treated with at least 3 large-diameter (>6.5 mm) cancellous screws from 2015 to 2019 at 2 institutions. Patients were excluded if there was sagittal plane fracture deformity and if clinical follow-up was less than 30 days. The primary outcome was “major complication” defined as unplanned reoperation, osteonecrosis (ON), deep infection, nonunion, and varus collapse/implant cutout.

**Results:** 207 patients (162 female, 45 male) were included in the study. The average age was 77 years (std dev, 11) and median clinical follow-up was 658 days (range, 30-2388). 33 patients had 36 major complications (17.3%) and 31 unplanned reoperations (15.0%). Underlying comorbidities and surgical fixation strategies were not associated with an increased risk of major complication (Table 1). 26 patients (12.6%) required conversion to arthroplasty. Major complications included ON (11), varus collapse/screw cutout (14), nonunion (5), deep infection (2), and hematoma (3). Three patients had ON with collapse and 1 underwent arthroplasty for progression of arthritis.

**Conclusion:** This study demonstrated a high rate of major complications and reoperation in patients with valgus-impacted femoral neck fractures without sagittal malalignment treated with in situ percutaneous screw fixation. Primary arthroplasty should be considered for select patients to reduce risk of reoperation.

Table 1. Risk factors for major complication after large diameter cancellous screw fixation of valgus impacted femoral neck fractures without sagittal malalignment

	Number of patients (%)	Yes Major Complication (%)	Odds ratio	95% CI	p-value
<u>Patient characteristics</u>					
Diabetes	41 (19.8%)	6 (14.6%)	0.85	0.3-2.23	1.00
Dementia	57 (27.5%)	7 (12.3%)	0.63	0.3-1.6	0.40
Smoking	17 (8.2%)	2 (11.8%)	0.66	0.2-3.0	0.70
<u>Surgical Fixation Strategy</u>					
Inverted triangle screw configuration	165 (79.7%)	26 (15.8%)	0.79	0.3-1.9	0.64
Use of ≥1 fully threaded screw(s) [vs all partially threaded screws]	69 (33.3%)	12 (17.4%)	1.11	0.5-2.4	0.84
Use of all fully threaded screws	41 (19.8%)	8 (19.5%)	1.31	0.5-3.1	0.64
Use of washer(s)	129 (62.3%)	20 (15.5%)	0.84	0.4-1.8	0.70

Legend: CI, confidence interval.

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