

Compressive Buttress Screw Fixation for Vertical Femoral Neck Fractures in Young and Middle-aged Population: a Retrospective Multicenter Study.

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INTRODUCTION: To compare clinical outcomes of compressive buttress screw (CBS) fixation, a novel hybrid screw fixation strategy to traditional screw fixation, for vertical femoral neck fractures (FNFs) in young and middle-aged adults.

METHODS: We did a multicentre study in 8 hospitals designated for patients with vertical FNFs. Patients (18-65 years) treated with screw fixation and followed up with complete record were included. The traditional screw fixation included the multiple parallel and off-axial partial-threaded cannulated screw (PTCS and OPTCS) fixations. Primary outcomes were complication rates during 24 months after surgery. Fixation loosening, femoral neck shortening and varus collapse, patient function and quality of life were assessed as secondary outcomes at 24 months.

RESULTS: 169 patients with CBS fixation and 309 with traditional screw fixation were included between Jan 1, 2019 and Dec 31, 2021. Both fixation groups were similar with regard to demographics at baseline. Patients in the CBS fixation cohort had significantly lower rates of fixation failure (9.6% vs. 27.4%, $p=0.027$), fracture nonunion (2.3% vs. 21.7%, $p=0.001$), and ANFH (5.2% vs. 13.9%, $p=0.035$). Patients managed with CBS showed significantly less fixation loosening (17.2% vs. 51.7%, $p<0.001$), less severe femoral neck shortening and varus collapse (9.6% vs. 23.3%, $p=0.031$), higher HHS (94 vs 82, $p=0.001$) and more excellent grade (72.1% vs. 40.3%, $p=0.017$), higher EQ-5D-5L (0.832 vs. 0.595, $p<0.001$) and EQ-VAS (87 vs. 81, $p=0.011$).

DISCUSSION AND CONCLUSION: The novel CBS fixation could reduce complications and improve hip function in young and middle-aged patients with vertical FNFs when comparing with traditional screw fixation.