

# Clinical results and complication rates of lower limb lengthening in paediatric patients using the PRECICE 2 intramedullary magnetic nail: a multicentre study

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## Abstract

Implantable intramedullary nail lengthening devices (e.g., PRECICE 2 system) have been proposed as alternative method to external fixation for lower limb lengthening surgery. The aim of this study was to analyse our outcomes and complications using the PRECICE 2 (P2) nail system and review them in light of the existing literature. A retrospective multicentre study was conducted on patients <18 years, who were treated for limb lengthening using the P2 system. The inclusion criteria were a limb length discrepancy  $\geq 30$  mm and a follow-up  $\geq 6$  months after the end of treatment. A total of 26 (15 males) patients were included, average age was  $14.7 \pm 2.3$  years; 26 nails (21 femur, 5 tibia) were implanted. The average goal lengthening was  $49.4 \pm 12.4$  mm, while average achieved lengthening was  $44.4 \pm 11.6$  mm. Average distraction and consolidation indexes were  $11.9 \pm 2.1$  days/cm and  $25.1 \pm 8.1$  days/cm, respectively. Nail accuracy and reliability were 91.1% and 88.5%, respectively. A total of five problems (joint contractures), one obstacle (femur fracture) and three complications (hip joint subluxation, deep infection and nail running back) were encountered. The P2 nail system is a valid alternative to external fixator for limb lengthening in young patients with no significant angular or rotation deformities. Our study confirms a favourable complication rate and available evidence from literature suggests a lower complication rate than external fixator systems. Nevertheless, surgeons should keep a watchful eye on risk of joint subluxation and mechanical complications with intramedullary lengthening.

