This study represents the largest analysis of ultrasound-guided access for children. A complete practice transition to the ultrasound-guided approach was feasible within a two-year period” Criss et al (2018).

Abstract:

BACKGROUND: Use of ultrasound-guidance for central venous access in adults is the standard of care. There is, however, less clarity in the role of routine ultrasound use in obtaining venous access in children. We sought to evaluate safety and efficiency of the placement of central lines utilizing an ultrasound-guided approach compared to the traditional, landmark approach in pediatric patients.

STUDY DESIGN: A single-institution retrospective chart review, using CPT codes, was performed for all tunneled central venous catheters in children between 2005 and 2017 by the same pediatric surgery group. During the study period, a practice change occurred from exclusively landmark-based line placement to ultrasound-guided line placement. Groups were divided into three phases: a traditional/landmark era (Phase 1), transitional period (Phase 2), and the ultrasound era (Phase 3). The primary outcomes analyzed were postoperative chest tube insertions and operative time.

RESULTS: A total of 2010 tunneled central lines were included for analysis: Phase 1 (N = 930), Phase 2 (N = 313) and Phase 3 (N = 767). Venous access for chemotherapy was the most
common indication (29%). Phase 1 had a chest tube placement rate of 9.7/1000 procedures, while Phase 2 had a rate of 6.4/1000 procedures, and Phase 3 had no chest tube insertions (p = 0.009). Phase 1 had longer OR times compared to Phase 2 (57 vs. 49, p = 0.0026) and Phase 3 (57 vs. 46 min, p < 0.001). CONCLUSIONS: This study represents the largest analysis of ultrasound-guided access for children. A complete practice transition to the ultrasound-guided approach was feasible within a two-year period. The ultrasound-guided approach had a shorter operative time and less chest tube insertions than the traditional, landmark technique in children. Level III evidence.

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