



Osteotomies at The Time of Graduation Surgery: How Much Do We Get from Them?

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Background

Following growing instrumentation for early onset scoliosis(EOS), patients often undergo PCO at conversion to definitive fusion. Their efficacy may be limited following prior instrumentation. Our purpose was to determine if PCO at conversion to definitive fusion in EOS graduates impacts outcomes.

Methods

Patients from a multicenter database undergoing growing rod instrumentation conversion to definitive fusion were grouped by those that did or did not have PCO. Patients with inadequate radiographs, <2 years of follow-up, or three-column osteotomies at time of fusion were excluded.

Results

839 EOS patients who underwent conversion to definitive fusion met inclusion criteria, 176(21%) had PCOs and 663(79%) did not. Age at index surgery was younger(6.6 vs. 7.4 years, $p = 0.0009$) and mean duration of growing instrumentation was greater(6.1 vs. 5.5 years, $p=0.009$) in the PCO group. Prior to fusion, curve magnitude was similar between the groups(PCO=61.9°, no PCO=59.3°, $p=0.18$).

For the PCO group, on average 4.4 osteotomies(range:1-12) were performed. EBL(PCO=821cc vs no PCO=752cc, $p<0.01$) and surgical time(PCO=403min vs no PCO=348min, $p<0.01$) were greater in the PCO group. Postoperatively, mean major curve magnitude and curve correction were similar between the two groups(mean correction:PCO=16.5°, no PCO=14.4°, $p=0.19$). However, accounting for preoperative curve magnitude, there was a relationship between number of PCOs and curve correction($p=0.04$). Mean correction was 14.2° with 1-4 osteotomies, 19.0° with 5-8 osteotomies, and 23.9° with 9-12 osteotomies.

Overall mean correction per osteotomy was 4.5°. No relationship between degrees of correction per osteotomy and duration of instrumentation prior to conversion($p=0.12$).

Postoperative complications at 2-years were similar between groups (PCO=25% vs no PCO=27%, $p=0.63$).

Conclusion

EOS graduates achieved minimal correction at time of conversion regardless if PCOs were performed. PCOs were associated with increased EBL and operative time, but similar complication rate. More PCOs resulted in more correction, albeit $<10^\circ$ /osteotomy anticipated in a previously uninstrumented spine.

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