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Correction of Congenital Cervical Scoliosis; Surgical Planning, Technique, and Clinical Results

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Background: There are very few reports on surgical treatment of congenital cervical scoliosis (CCS), which is technically challenging.

Purpose: We would like to report our surgical planning, techniques, and clinical results in corrective surgery for CCS, and discuss future treatment strategies.

Case Materials: Five consecutive children (8-14 years old) and a 29-year-old adult with CCS were studied. Goldenhar syndrome and Sprengel deformity were observed in two patients each. The postoperative follow-up period ranged from 5 to 132 months (avr. 50 months).

Methods: In all cases, an anterior wedge osteotomy (WO) was followed by a posterior closing WO with posterior spinal instrumentation (SI). Osteotomy line was determined by preoperative precise CTA investigation of vertebral arteries (VA"s). On the closing side, the anterior wall of the transverse process and the posterior lateral mass were removed, and the VA/nerve root was palpated or visualized during surgery. Correction angle, bony union, and post-operative complications were investigated.

Results: The Cobb angle was difficult to measure on plain radiographs due to the complex anomalous deformity. In 4 cases, an osteotomy gap of approximately 20 degrees was completely closed. In two cases, only a 5 degree correction was possible due to insufficient anterior osteotomy or intraoperative MEP alarm. Bony union was obtained in all cases. Postoperative severe U/E weakness (down to MMT1 or 2) developed in 3 cases (C5/6/7 in 2 cases, C5/6 in one) and recovered to MMT 4+ to 5 one year after surgery. No long tract impairment occurred. One case of Goldenhar syndrome had difficulty extubating postoperatively and required a 3-week tracheotomy.

Discussion: Protection of the VA"s has been successfully done, but the prevention of nerve root damage on the closing side is still controversial. We would like to present our surgical techniques in detail with several photos, and discuss with society members for future reference.