

## Introduction

To present a novel salvage technique for pediatric subaxial cervical spine fusion in which lateral mass screw fixation was not possible due to anatomic constraints

## Methods

This is a case presentation detailed a 4 year old patient with C5-C6 flexion/distraction injury with bilateral jumped facets. Posterior cervical fixation was attempted; however, lateral mass fracture occurred during placement of screws. Using a wire-screw construct, an attempt was made to provide stable fixation. Patient was followed post-operatively for assessment of outcomes.

## Results

After the patient had progressive kyphosis following initial closed reduction and external orthosis, internal reduction with fusion/fixation was performed. Lateral mass fracture occurred during placement of lateral mass screws. After placement of a sub-laminar wire-lateral mass screw construct, intraoperative evaluation determined stability. Post-operatively, the procedure resulted in stable fixation with evidence of bony fusion on follow-up.

Figure 1

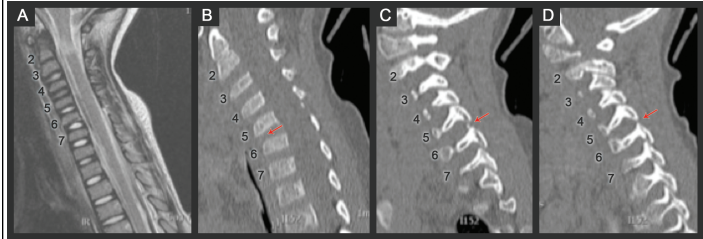


Figure 1 – Follow-up imaging 3 months after initial injury. A) Sagittal MRI demonstrating myelomalacia at the C1-2 level B-D) Sagittal CT demonstrating focal kyphosis at C5-6 with bilateral facet disruption, left C5 facet fracture and 2mm anterolisthesis of C5 on C6

Figure 2

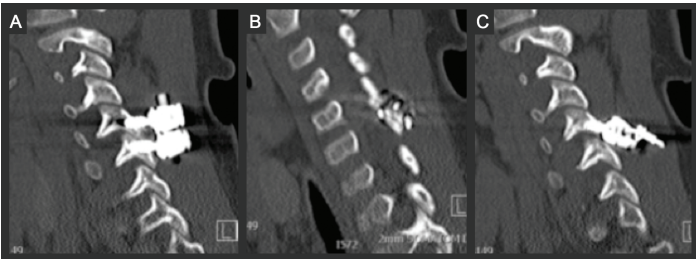


Figure 2 – Postoperative sagittal CT. (A-C) Sagittal CT of hybrid construct demonstrating intact right C5-C6 lateral mass screw with rod and hybrid left C6 lateral mass screw with sublaminar wire construct.

Figure 3

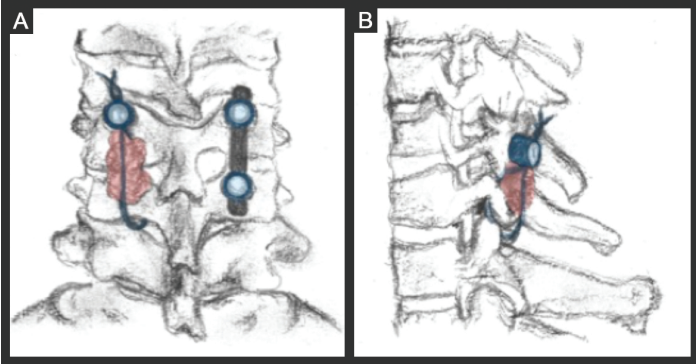


Figure 3 – Postoperative sagittal CT. Artist rendering of hybrid construct demonstrating right C5-6 lateral mass screws and rod along with left side C5 lateral mass wire-screw construct. The pink structure under the wire construct on the dorsal surface of the lamina is gel foam for cushioning.

## Conclusions

Pediatric subaxial cervical spine instrumentation provides rigid fixation however is technically difficult due to anatomic and instrumentation related constraints. In the presented case, the wire-screw construct resulted in stable fixation and bony fusion on follow-up. A modified sublaminar wire-lateral mass screw construct is an example of a salvage technique that provides immediate stability in the event of instrumentation related lateral mass fracture.

## Learning Objectives

Lateral mass screw breakthrough can occur in pediatric spine trauma.

Stabilization of lateral mass breakthrough in pediatric spine cases is challenging.

Wire-Screw hybrid fixation techniques can be used as a salvage option for stabilization and can lead to successful fusion.

Figure 4

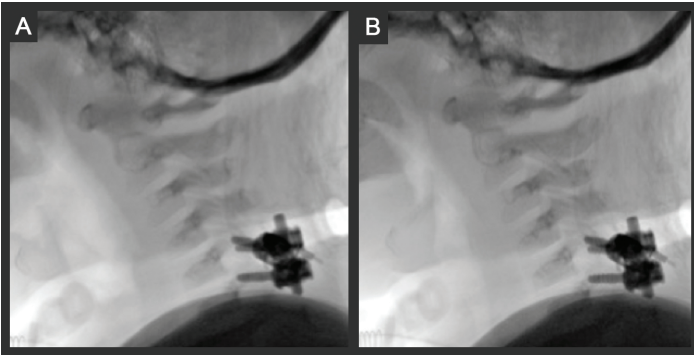


Figure 4 – 3-Month lateral flexion-extension X-Ray. Post-operative image showing stable fixation and no motion across C5-C6 level.