

## Placement of C1 Screws Using an Alternative Technique Allows Preservation of the C2 Nerve

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### Introduction

Most commonly employed Harms and/or Goel technique often involves manipulating the C2 nerve root to obtain an appropriate corridor for C1 screw insertion. Controversially, the nerve root is sometimes advocated to be sectioned to improve pain. Using an alternative technique for placing C1 lateral mass screws can avoid the need to manipulate the C2 nerve. We present a specific retrospective outcomes based analysis of the C2 nerve root after placing C1 lateral mass screws via a previously published alternative technique.

### Methods

A retrospective chart review was performed from 2012-2016 of surgeries performed by the senior author (FAS). 25 patients were identified to have met criteria for analysis. The surgical technique for alternative C1 screw placement has been described previously. All patients were retroactively questioned regarding C2 nerve root dysfunction at their most recent follow-up (minimum 6 months)

### Results

In all patients, bilateral C1 screws were placed without sectioning of the C2 nerve. When patients were retroactively questioned regarding occipital numbness, 6 of 25 patients stated that they had persistent daily occipital numbness. When asked specifically regarding occipital paresthesias/dysesthesias, 7 of 25 patients admitted to intermittent weekly disturbances. 12 of 25 patients admitted to occipital radicular type pain. CT scans showed all screws were in good position without any direct contact of the C2 nerve and judged to be irresponsible for patient symptoms.

### Conclusions

The alternative C1 screw placement is a technique that provides robust C1 fixation without manipulation of the C2 nerve root. Our retrospective results demonstrate that the high rates of occipital-type dysfunction may be a result of surgical exposure, irrespective of the C2 nerve root. A recall bias may be part of the results in our small series. A larger prospective study comparing traditional C1 screw techniques is warranted.

### Learning Objectives

1. The alternative C1 screw technique provides robust fixation
2. The alternative technique leads to less C2 nerve root dysfunction
3. This technique will add to the armamentarium of spine surgeons

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