

Systematic Review of Timing and Associated Complications of Odontoidectomy in Relation to Fusion

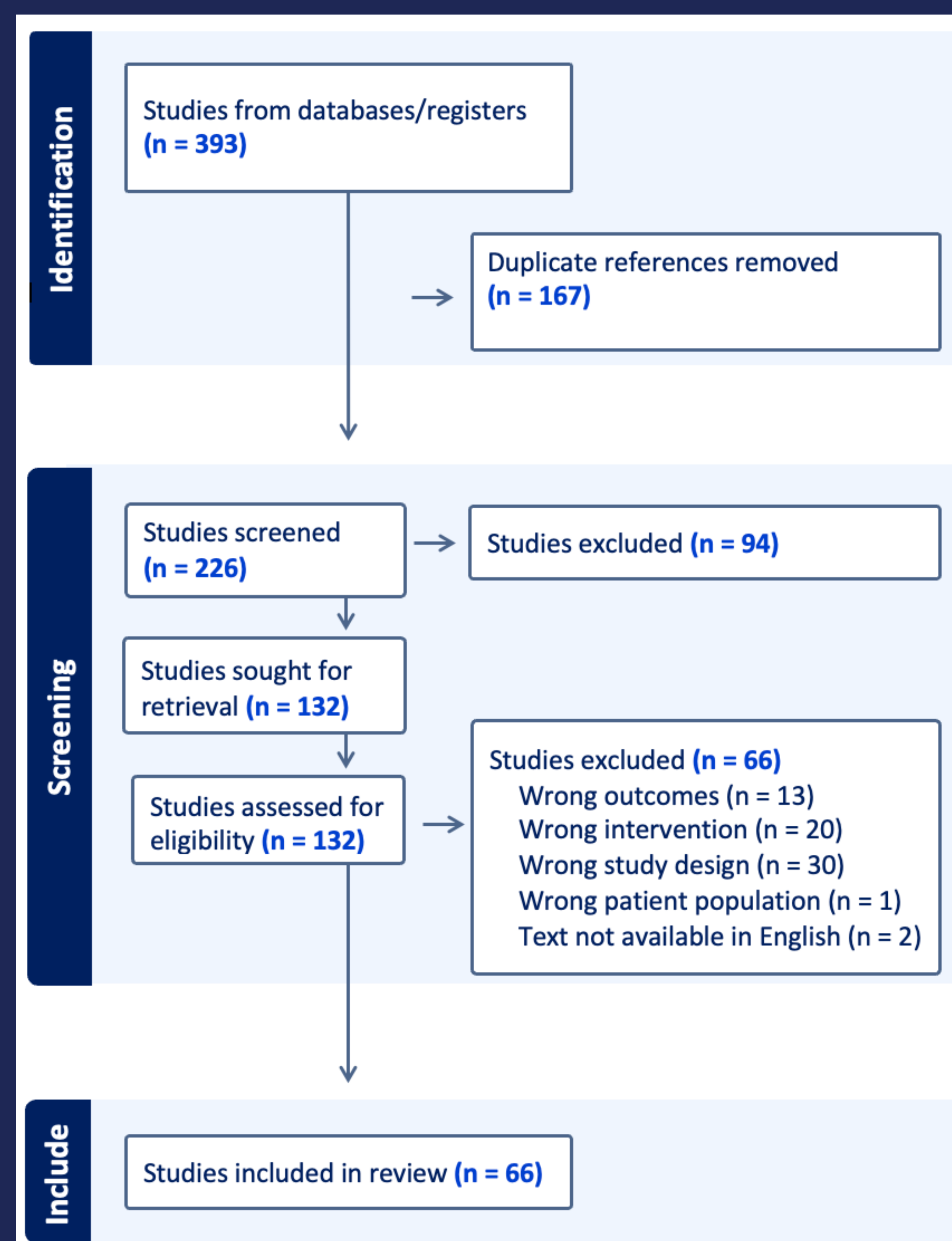


- Combined odontoidectomy and cervical fusion is the most common approach to treat ventral nonreducible pathologies of the craniovertebral junction (83.4% of patient cases)
- Combined surgery has higher of complications (14.1%) compared to staged surgeries: F,O (10.0%) and O,F (7.5%)



Basilar Invagination Pre-Op Basilar Invagination Post-Op

Occipito-Cervical Fusion Post-Op



PRISMA guidelines

Methods

- A systematic review of the English literature was performed by two independent reviewers
- MEDLINE, CINAHL, Cochrane, and ProQuest databases were searched with the search terms “odontoidectomy” and (“fixation” or “fusion” or “arthrodesis”) for all date ranges.
- PRISMA guidelines were followed.
- Results were uploaded to Covidence software for analysis
- Manuscripts that identified at which point fusion is done in relation to odontoidectomy were included in the study.
- Data on the number of manuscripts and patients, dates of publication, age of patients, complications, and indications for surgery were extracted.

Results

- 66 relevant manuscripts with a total of 476 patients were identified
 - 397 patients (83.4%) from 39 manuscripts (59.0%) had odontoidectomy and fusion during the same anesthesia period (O+F)
 - 40 patients (8.4%) from 14 manuscripts (21.2%) had fusion after odontoidectomy as separate anesthesia periods (O,F) but during the same hospital admission
 - 29 patients (6.1%) from 11 manuscripts (16.7%) had no fusion (N)
 - 10 patients (2.1%) from 2 manuscripts (3.0%) had fusion before odontoidectomy (F,O) during the same hospital admission.
- Manuscripts for all approaches included pediatric and adult patients.
- The median length between the two operations for O,F approach was 6 days (range: 1-16 days); meanwhile for F,O approach the median length was 4 days (range: 2-7 days).
- Complication rates were the highest for O+F approach at 14.1%, while staged surgeries had lower rates of complications at 10.0% for F,O and 7.5% for O,F.

Introduction

- Ventral pathologies of the craniovertebral junction result in mechanical instability of the upper cervical spine.
- Transoral or transnasal odontoidectomy can further exacerbate the underlying instability, necessitating the use of posterior instrumented fusion.
- There is a paucity of literature establishing the timing of posterior fusion in relation to odontoidectomy.
- We previously studied our series of odontoidectomies which were followed by staged posterior cervical fusion, finding no complications in a case series of 11 patients. Patients remained in a rigid collar between surgeries.
- Benefits of a staged approach include improved surgeon maneuverability, decreased secretions, not placing the patient prone immediately after a transnasal procedure, and easier logistical scheduling of surgical teams.
- We were interested to see how other surgical centers approach the timing of odontoidectomy in relation to cervical spine fusion.
- We report a systematic review of the literature on timing, sequence, and complications of odontoidectomy in relation to cervical spine fusion.