Introduction: Endoscopic endonasal surgery (EES) is a relatively novel approach to the craniovertebral junction (CVJ). The purpose of this analysis is to determine the surgical outcomes of patients who undergo purely EES of the CVJ.

Methods: A search for articles related to EES of the CVJ was performed using the MEDLINE/PubMed database. A bibliographic search was done for additional articles. Demographics, presenting symptoms, imaging findings, complications, follow-up, and patient outcomes were analyzed.

Results: Eighty-eight patients from 30 articles were included. The mean patient age was 48.4 ± 24.6 years (range 3-96 years), with 44.3% being male. The most common presenting symptom was myelopathy (n=64, 72.7%). The most common indications for surgery were brazier infection compression secondary to basilar invagination (n=41, 46.6) and odontoid pannus (n=20, 22.7%). Odontoidectomy was performed in 94.3% of cases. Intraoperative complications occurred in 16 patients (18.2%) and postoperative complications occurred in 18 patients (20.5%). Six patients developed postoperative respiratory failure necessitating a tracheostomy. Neurologic improvement was seen in 88.6% of patients at a mean follow-up of 22.2 months.

Conclusion: Our analysis found that EES of the CVJ results in a high rate of neurologic improvement with acceptable complication rates. Given its minimally invasive nature and high success rate, this approach appears to be a reasonable alternative to the traditional transoral transpalatal surgery in select cases. This study represents the largest pooled sample size of EES of the CVJ to date. Increasing use of the endoscopic endonasal approach will allow for further studies with greater statistical power.

ABSTRACT

The craniovertebral junction (CVJ) is the highest point of the spinal axis and is often the site of pathologic processes requiring surgical intervention, especially in cases of brainstem compression. The transoral approach is the gold standard for surgery at the CVJ, but is associated with various morbidities resulting from disruption of palate and tongue anatomy, including increased duration of postoperative intubation and nasogastric tube, bacterial contamination of the surgical field with oral flora, and vertebral insufficiency.

Endoscopic endonasal surgery (EES) is a relatively new approach to the CVJ and has been shown to eliminate some of these complications. This approach may be particularly advantageous in pediatric populations, patients with Down Syndrome, or individuals with other congenital defects that commonly present with anatomical variations such as narrow oral cavities, micrognathia, macrognathia, or a high position of the odontoid.\textsuperscript{2,3,4,5,6,7,8,9} As a relatively novel surgical approach, the majority of the information regarding EES of the CVJ is limited to case reports and small case series. This systematic review is an ideal approach to studying this topic and aims to evaluate the demographics, complications, and surgical outcomes of patients who undergo EES of the CVJ.

METHODS

A search for articles related to EES of the CVJ was performed using the MEDLINE/PubMed database. A bibliographic search was done for additional articles. Demographics, presenting symptoms, imaging findings, complications, follow-up, and patient outcomes were analyzed.

RESULTS

Eighty-eight patients from 30 articles were included. The mean patient age was 48.4 ± 24.6 years (range 3-96 years), with 44.3% being male. The most common presenting symptom was myelopathy (n=64, 72.7%). The most common indications for surgery were brainstem compression secondary to basilar invagination (n=41, 46.6) and odontoid pannus (n=20, 22.7%). Odontoidectomy was performed in 94.3% of cases. Intraoperative complications occurred in 16 patients (18.2%) and postoperative complications occurred in 18 patients (20.5%). Six patients developed postoperative respiratory failure necessitating a tracheostomy. Neurologic improvement was seen in 88.6% of patients at a mean follow-up of 22.2 months.

CONCLUSION

Our analysis found that EES of the CVJ results in a high rate of neurologic improvement with acceptable complication rates. Given its minimally invasive nature and high success rate, this approach appears to be a reasonable alternative to the traditional transoral transpalatal surgery in select cases. This study represents the largest pooled sample size of EES of the CVJ to date. Increasing use of the endoscopic endonasal approach will allow for further studies with greater statistical power.

REFERENCES