

Beyond the Beak: Anticipation of Airway Difficulty in Eagle's Syndrome

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ABSTRACT

Eagle's syndrome is a rare condition characterised by elongation of the styloid process or ossification of the stylohyoid ligament, which may result in facial or cervical pain, dysphagia, and restricted jaw movement. The normal length of the styloid process ranges from 20 to 30 mm; elongation can cause impingement on adjacent anatomical structures, leading to significant discomfort. Diagnosis is radiological, and symptomatic cases often require surgical intervention. A 38-year-old male presented with restricted mouth opening for six to seven months, along with sharp, intermittent pain triggered by eating and yawning. The pain radiated to the ear, neck, and back. He also reported two previous episodes of jaw locking that resolved spontaneously. Clinical examination revealed restricted and painful Temporomandibular Joint (TMJ) movements, deviation of the jaw to the right on opening, and bilateral hypertrophy of the masseter and temporalis muscles. Airway assessment showed Mallampati class II with slight limitation in neck extension. Imaging with Orthopantomogram (OPG) and Cone Beam Computed Tomography (CBCT) confirmed bilateral styloid process elongation, measuring 46.44 mm on the right and 48.13 mm on the left. The patient was scheduled for bilateral styloidectomy under general anaesthesia. Multiple nasal intubation attempts were required due to poor laryngeal visibility, ultimately successful with the use of a bougie and a smaller Endotracheal Tube (ETT). Postoperative evaluation indicated that calcified stylohyoid ligaments may have contributed to the difficult airway management.

Keywords: Airway management, Calcified stylohyoid ligament, Diagnostic imaging, Nasotracheal intubation, Temporomandibular joint disorders

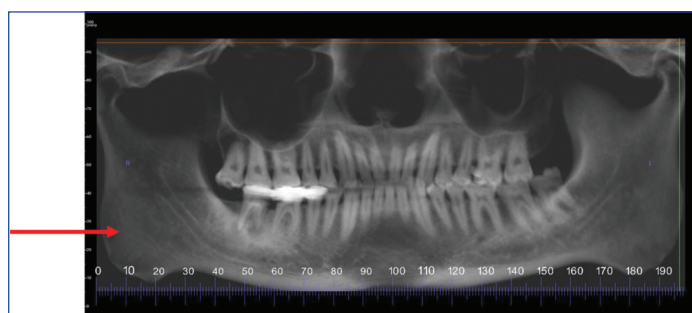
CASE REPORT

A 38-year-old male presented with restricted mouth opening for six to seven months and pain while eating and yawning for five months. The pain was sudden in onset, severe, intermittent, lasting 2-3 minutes, and radiated to the neck, back, and ear. He reported two episodes of jaw locking that resolved spontaneously. There was no history of dysphagia, throat pain, or pain during tongue or mandibular motions. The patient had no other known comorbidities.

Airway examination revealed Mallampati Class II with a mildly restricted neck extension. TMJ mobility was restricted and painful. The thyromental distance was 6.6 cm, and the interincisor gap was 3.2 cm. Bilateral asynchronous movements were noted during opening and closing of the mouth toward the right. Hypertrophy of the temporalis and masseter muscles was noted bilaterally. Preoperative investigations, including blood tests, ECG, and chest X-ray, were within normal limits. An OPG [Table/Fig-1] and CBCT [Table/Fig-2] showed elongation of the styloid processes, right side 46.44 mm and left side 48.13 mm. The patient was planned for bilateral styloidectomy under general anaesthesia with nasal intubation for better surgical access.



[Table/Fig-2]: Cone Beam Computed Tomography (CBCT) showing elongated styloid process.



[Table/Fig-1]: Orthopantomogram (OPG) showing elongated styloid process.

On the day of surgery, nil by mouth status was confirmed, informed consent obtained, and the patient shifted to the operating

theatre where standard American Society of Anesthesiologists (ASA) monitors were attached. The patient was pre-oxygenated with 100% oxygen for three minutes, during which intravenous midazolam (0.02 mg/kg), glycopyrrolate (0.04 mg/kg), and fentanyl (2 mcg/kg) were given. Induction was achieved with propofol (2 mg/kg) and vecuronium (0.1 mg/kg). Nasal intubation with a North Pole tube (7.5 mm) was attempted but failed on the first attempt due to poor visualisation of the larynx. As apnea time increased and nasal intubation remained challenging, an oral intubation using a size 8.0 mm ETT was attempted and initially difficult but eventually successful, and the patient was ventilated for three minutes. A second nasal intubation attempt was made with the tube angle slightly tilted to aid passage; however, difficulties persisted, and oral intubation had to be performed again. On the third attempt, a bougie was used with external laryngeal pressure, and nasal intubation with a smaller

North Pole tube (7.0 mm) was successful. After confirming correct tube placement by auscultation and end-tidal CO₂, the tube was secured, and anaesthesia was maintained with an O₂:N₂O mixture (50:50) and isoflurane with intermittent vecuronium, then handed to the surgeons.

The surgery was successful, and neuromuscular blockade was reversed with neostigmine (0.05 mg/kg) and glycopyrrolate (0.08 mg/kg). The patient was extubated uneventfully and shifted to the postoperative room with stable vitals and no signs of airway compromise. Postoperative evaluation suggested calcified stylohyoid ligaments, which may have affected laryngeal mobility and contributed to the difficult airway and nasal intubation.

DISCUSSION

Eagle's syndrome presents a unique challenge in airway management due to potential anatomical changes in the upper airway. Elongated styloid processes or calcified stylohyoid ligaments can cause compression or distortion of adjacent structures, leading to difficulties in airway visualisation and intubation [1]. According to Eagle, prior surgical procedures such as tonsillectomy or persistent irritation of the stylomandibular ligament may result in conditions such as osteitis, tendinitis, or periostitis, potentially leading to reactive ossifying hyperplasia of the styloid process [2]. Management of Eagle's syndrome can be medical or surgical. Medical treatment includes administration of steroids, local anaesthetics via infiltration, or oral carbamazepine. Surgical intervention [Table/Fig-3] involves a transoral or transcervical approach for resection of the styloid process [3-6]. A case by Amir MA et al., (2023) reported Eagle's syndrome with marked narrowing of the proximal left internal

carotid artery with 70% stenosis, leading to cervicofacial pain, headaches, and sudden episodes of loss of consciousness occurring spontaneously [4]. After confirmatory diagnosis via neck CT scans and angiography, the patient underwent surgical excision of the elongated styloid process via a transcervical approach as the styloid process lay deep in the tonsillar fossa. Although medical and surgical interventions are available, this case required surgical management. The patient had an uneventful surgery and, on follow-up, reported complete relief of symptoms.

In this case, the elongated styloid process may have reduced the space available for direct visualisation of the vocal cords, particularly during neck extension in laryngoscopy. This highlights the importance of considering anatomical variations during preoperative assessment and planning for difficult intubation strategies. While this patient had no significant prior airway problems, his anatomical abnormalities necessitated a more cautious and prepared approach to intubation.

CONCLUSION(S)

Eagle's syndrome presents significant challenges that can impair laryngeal mobility and reduce airway visualisation during intubation. In this case, despite an initially unremarkable airway assessment, difficulties were encountered during nasal intubation, necessitating multiple attempts and adjustments in technique. Successful intubation was achieved using a smaller tube and bougie assistance, highlighting the importance of preoperative preparedness and adaptability in difficult airway scenarios. This case underscores the need for thorough preoperative evaluation of head and neck anatomy in patients with Eagle's syndrome. Routine airway examination should include assessment of laryngeal mobility. Preoperative X-ray views of the neck (AP and lateral) should be obtained. Video laryngoscopy or fibreoptic intubation can be advantageous in managing challenging airways, as they provide enhanced visualisation of laryngeal structures and increase the likelihood of successful intubation. In cases with narrowed or anatomically restricted airways, using a smaller endotracheal tube may aid in smoother tube placement.

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Study	Case presentation	Anaesthetic approach	Outcome
Kapoor V et al., (2015) [3]	Two patients posted for surgical removal of elongated styloid bone via intraoral approach	Local anaesthesia given as submucosal infiltration along medial aspect of ascending ramus and intraoral mandibular nerve block with inj. 2% lignocaine with 1:80000 adrenaline	Procedure for both successful under local anaesthesia
Amir MA et al., (2023) [4]	65/Male, Eagles syndrome with carotid artery syndrome	General anaesthesia	No complications, procedure uneventful
Ozgenur Bacaksiz (2022) [5]	38/female, o/c/o bilateral styloidectomy posted for axillary lymph node biopsy	Fibreoptic intubation	No complications during intubation
Supsic B et al., (2023) [6]	Patient posted for styloidectomy	Intubation with the help of a Glidescope	Uneventful intubation
Present case	38-year-old male, posted for bilateral styloidectomy	General anaesthesia with nasal intubation	Difficult intubation, multiple attempts required. Procedure uneventful

[Table/Fig-3]: Case reports showing different anaesthetic approaches for Eagle's syndrome.

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