



Tapia Syndrome as a Postoperative Complication of LMA Use During TFCC Reconstruction: A Rare Case Report

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ABSTRACT

Background: Tapia Syndrome is a rare neurological condition characterized by concurrent paralysis of the hypoglossal nerve (XII) and the laryngeal branch of the vagus nerve (X), typically resulting from mechanical trauma or excessive pressure to the neck area during general anesthesia. It typically presents with symptoms such as dysarthria, dysphagia, and ipsilateral tongue deviation. One reported risk factor is the use of airway devices such as the *Laryngeal Mask Airway* (LMA), which can exert localized pressure on these cranial nerves. Although uncommon, this complication is important to recognize, particularly among anesthesiologists and otolaryngologists, due to its impact on speech and swallowing functions.

Objective : To report a case and management of a patient with Tapia Syndrome

Methods: The study employs a case report methodology supported by a literature review through Pubmed, Cochrane

Library, and NCBI using the keywords tapia syndrome, paralysis of nervus XII and IX. 15 articles were found, and articles were selected based on inclusion and exclusion criteria, and 11 relevant studies were obtained.

Results: The patient presented with dysarthria and tongue deviation on the first postoperative day, with no signs of central neurological deficits. A clinical diagnosis of Tapia Syndrome was made based on the symptoms and anesthesia history. Supportive therapy and speech rehabilitation were initiated, resulting in gradual recovery over several weeks. Literature review suggests that most similar cases show good outcomes with conservative management.

Conclusion: Tapia Syndrome is a rare but significant complication of LMA use during general anesthesia. Awareness of potential cranial nerve injury during airway device placement is essential, particularly in surgeries involving head and neck positioning. Early diagnosis and multidisciplinary management were critical in the patient's recovery

Keywords: *Tapia syndrome, Paralysis Vagus nerve, Paralysis Hypoglossal nerve, TFCC reconstruction*

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INTRODUCTION

Tapia's syndrome is known as a rare complication of airway manipulation. It can occur after any type of surgery that is performed while the patient is under general anesthesia and orotracheally intubated¹. On this case, the symptom was occur after TFCC repair surgery. The triangular fibrocartilage complex (TFCC) is a structure located in the wrist that stabilizes the ulnar side of the joint. Surgical repair of the TFCC is indicated in cases of injury, particularly after trauma. It typically presents with symptoms such as dysarthria, dysphagia, ipsilateral tongue deviation, and swallowing difficulty¹. This syndrome is characterized by neurologic deficits involving the hypoglossal nerve (XII) and recurrent laryngeal branch of the vagal nerve (X). Tapia syndrome was first described by Spanish otorhinolaryngologist Antonio Garcia Tapia in 1904 as a lesion outside the central nervous system causing neurological signs and symptoms.

The use of airway devices like the Laryngeal Mask Airway (LMA) is considered relatively safe; however, improper positioning, prolonged pressure, or anatomical variations can predispose patients to nerve compression injuries. In surgeries involving the head and neck such as dental reconstructive procedures the risk of such complications may be heightened due to patient positioning and airway device manipulation. This complication frequently missed by anaesthesia care team in recovery room due to delayed symptomatic onset. Early consultation with Otolaryngology and Neurologist is necessary to guide the diagnostic examination and help identify this serious condition promptly⁸.

CASE REPORT

Patient Background:

A 27-year-old female patient (weight, 58 kg, height , 165 cm) with medical history of Asthma and no history of neurological dysfunction. The patient presented with wrist pain following a fall on the outstretched hand. The patient underwent routine pre-operative assessments, including a physical examination and imaging. There were no pre-existing neurological symptoms, and the

patient had normal neurological function. Imaging confirmed an injury in the triangular fibrocartilage complex (TFCC). Conservative treatments, including immobilization and physical therapy, were ineffective. The patient was therefore scheduled for arthroscopic TFCC repair under general anaesthesia.

Surgical Procedure:

The patient was placed under general anaesthesia with the use of LMA. The anaesthesia given nebulizer of Combivent and 2gr of Ceftriaxone for premedication, 2 hour before surgery. On arrival at the operating room, Anesthesia was induced with 1 mg of midazolam, 20 mg of sufentanyl, and 100 mg of propofol. A novel size-4 laryngeal mask was then inserted smoothly. The location of LMA inserting was confirmed by capnography, with the absence of sounds over the epigastrium. The patient was positioned with his arm abducted and immobilized to allow for arthroscopic access to the wrist. The head was placed on supine position. The TFCC repair was performed arthroscopically using standard portals and suture techniques. The patient remained hemodynamically stable during surgery. The operation began 1 hour after the medication was administered. The operation was very smoothly performed, lasting approximately 150 minutes, and the anesthesia time was 180 minutes, and no immediate complications were noted. After surgery finished, the patient moved to postanesthesia care unit.

Postoperative Course:

Day 1 Post-Op: The patient noticed mild difficulty swallowing (dysphagia) and unclear speech. On the physical examination, her pharynx was hiperemis (figure 1.a) also there is decrease on gag reflex. She had no voice changes or altered taste sensation. Initial evaluation by the surgical team focused on possible side effects of anesthesia and intubation. There was no immediate concern for neurological issues at this point.

Day 2 Post-Op: The patient developed increasing difficulty swallowing, dysphagia, and dysarthria.

Physical examination revealed:

- a. Tongue Deviation:** Upon examination, the patient's tongue deviated to the right side, indicating a possible hypoglossal nerve injury. (figure 1.b)
- b. Dysphagia:** The patient struggled with swallowing both liquids and solids, raising concerns for vagus nerve involvement (affecting swallowing reflexes and vocal cord control). These symptoms suggested neurological dysfunction, prompting immediate referral to a neurologist.

Neurological Findings

The patient was referred to the Neurologist after that sign appears. The neurological evaluation revealed the following:

- On the cranial nerve examination, there were no paralysis on CN VII (facial nerve), CN III (oculomotor nerve), symmetric on uvula. The neurologist diagnoses that the patient's right-sided tongue weakness, evidenced by the tongue's deviation to the right was consistent with the right hypoglossal nerve palsy (Cranial Nerve XII).
- The patient exhibited a unclear speech (dysarthria) and difficulty swallowing, indicating involvement of the recurrent laryngeal nerve, a branch of the vagus nerve. This nerve controls muscles in the larynx (voice box), which could explain the dysphonia (Cranial Nerve X).
- Laryngoscopic examination was not performed on this patient.

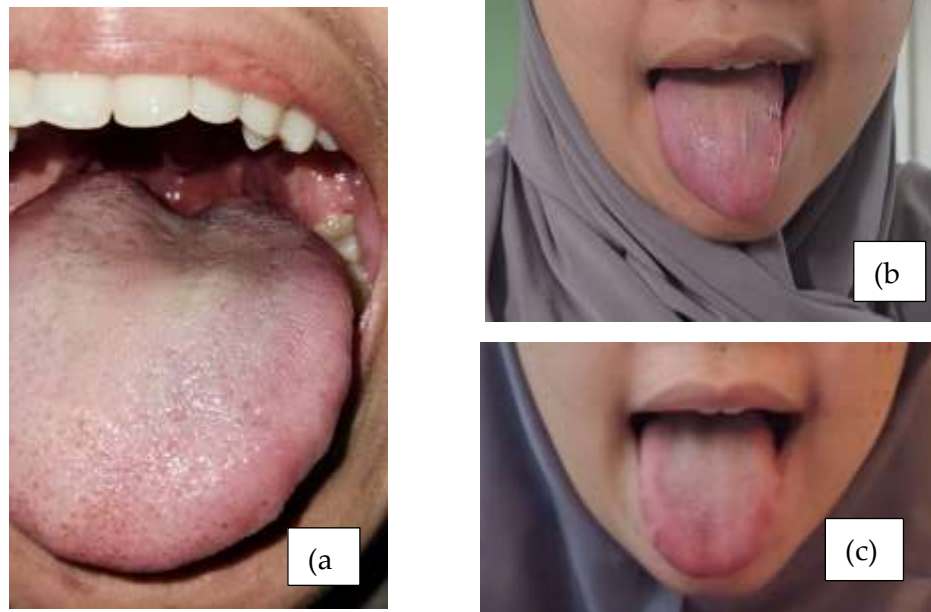


Figure I : (a) Physical examination of the throat and tongue on postoperative day 2. The tongue position was still on normal, but the pharynx was hiperemis. (b) Physical examination of the tongue was deviated to the right side three days later. The deviation of the tongue demonstrating the right hypoglossal nerve palsy. (c) Physical examination of the tongue 3 weeks later. The deviation of the tongue disappeared showing a complete recovery of hypoglossal nerve function.

DISCUSSION

Tapia's syndrome is an uncommon disease described in 1904 by Antonio Garcia Tapia, a Spanish otolaryngologist. It is characterized by paralysis of the hypoglossal (XIIth) and pneumogastric (Xth) nerves¹. It can occur after any type of surgery that is performed while the patient is under general anesthesia and orotracheally intubated. A literature search utilizing PubMed/Google Scholar from 2007 to 2023 produced six case reports with injury to the lingual nerve involving the LMA². In this case, the paralysis was further associated with the use of a laryngeal mask airway (LMA), a device typically employed in airway management during surgery². Although the LMA is considered safer and less invasive than endotracheal intubation, it is not without risks, including cranial nerve injuries. The LMA is one of the most widely used supraglottic airway devices³. Branches of the trigeminal, glossopharyngeal, vagus, and hypoglossal nerves are

considered involved in the cranial nerve injury⁴. The manifestation is depending on the cranial nerves that damages.

In this case, several possible mechanisms could explain the hypoglossal and vagus nerve paralysis:

1. **Anesthetic Considerations/Endotracheal Intubation:** The regional nerve block and general anesthesia may have contributed to unrecognized positioning issues or induced nerve injury via inadvertent pressure during the procedure². Hypoglossal and vagus nerve injury may occur due to overextension of the neck or improper placement of the endotracheal tube, resulting in nerve compression, ischemia, or stretching³. Both the hypoglossal and vagus nerves run close to the path of intubation, particularly in the hypopharyngeal region making them vulnerable during airway manipulation².
2. **Patient Positioning:** The patient was in supine position with neck extension during the surgery. Excessive neck extension, rotation, or compression during the surgery may have caused stretch or compression of the nerves in the carotid sheath, which houses the vagus and hypoglossal nerves. Cranial nerve injury can result from prolonged pressure on the neck or hyperextension¹.
3. **Indirect Trauma or Compression:** Although less likely, there is a theoretical risk that prolonged pressure on the neck or lateral head positioning during surgery could affect the cranial nerves, particularly at vulnerable anatomical locations where the hypoglossal and vagus nerves exit the skull (e.g., the hypoglossal canal and jugular foramen)¹.
4. **Ischemia:** a transient ischemic event due to altered blood flow from neck positioning or prolonged anesthesia may have contributed to temporary cranial nerve dysfunction, although no clear vascular compromise was observed on imaging.

Vagus Nerve Paralysis: The vagus nerve controls functions of the larynx and pharynx. Injury to this nerve, particularly its recurrent laryngeal branch, can cause hoarseness, difficulty speaking, and swallowing problems (as seen in this case). Paralysis of the laryngeal muscles can result in dysphonia due to impaired vocal cord movement. This type of injury is typically associated

with airway management techniques like endotracheal intubation or LMA insertion.

Hypoglossal Nerve Paralysis: The hypoglossal nerve controls the muscles of the tongue. Injury to this nerve causes tongue weakness and atrophy on the affected side, leading to difficulty in speech and swallowing. In this case, the tongue's deviation to the right upon protrusion was a classic sign of right hypoglossal nerve paralysis.

According to a case report by Paolo (2016), A 36-year-old Caucasian man underwent surgical drainage of a neck abscess (dental origin, 47–48) with general anesthesia and orotracheal intubation and had Tapia Syndrome after surgery. Laryngoscopic examination was performed on this patient. The examination show that there was a vocal cord paralysis on the right side⁵.



FIGURE 2 : Pharyngoepiglottic muscle



FIGURE 3 : Tongue and epiglottal

Potential risk factors for hypoglossal nerve injury are use of nitrous oxide, inappropriate size of the LMA, the lateral position, extreme head side rotation, primary illnesses, and difficult insertion of the LMA³. In our case, the LMA's size is chosen base on the body weight, the position of the patient was supine . The hypoglossal nerve, which is responsible for the motor function of the tongue, is particularly vulnerable to compression or stretching during airway manipulation^{6,4},. In this case, the patient presented with dysphagia and difficulty with tongue mobility postoperatively, indicating hypoglossal nerve dysfunction. The nerve passes through the hypoglossal canal and runs

in close proximity to the airway structures⁴. Excessive pressure from the LMA, particularly at the base of the tongue or near the hyoid bone, may have led to the nerve injury, as has been documented in other cases. Prolonged positioning during surgery, especially when combined with the surgical manipulation of the TFCC reconstruction, can further increase the risk of nerve injury^{7,2}.

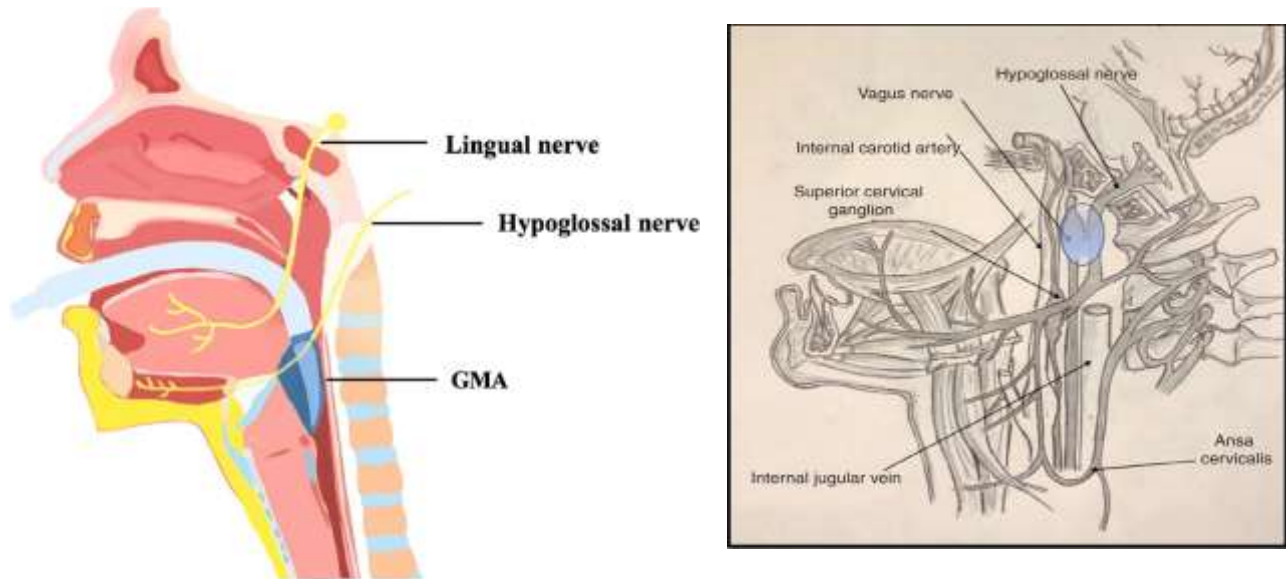


FIGURE 4: Image of an inserted supraglottic airway demonstrating how it can compress the lingual and hypoglossal nerves.

There are several hypotheses that can provide a feasible explanation, the use of nitrous oxide. It is well known that nitrous oxide will diffuse into the LMA cuff and increase the cuff pressure with time during anesthesia³. The cuff pressure of LMA Classic and LMA ProSeal has been shown to increase from 60 cm H₂O to over 100 cm H₂O following 30 min of nitrous oxide exposure³.

The complete recovery of hypoglossal nerve injury has been reported to occur within 6 weeks- 6 month^{8,9,3}. In terms of management, the patient was treated with conservative (including speech) and therapeutic therapy. Conservative management typically involves physical therapy to

enhance tongue strength and coordination, with a gradual recovery of nerve function expected in most cases⁴. Some other case reported recovery spontaneously⁶.

Management:

- a. The patient was treated conservatively with close observation, speech therapy, and therapeutic management to manage her dysphagia and dysphonia. Steroids is given for 3 days but no significant changes. Mecobalamin is given 500 mg three time a day and Citicoline 500 mg two times a day for 1(one) month, and intructed for follow up at the Neurologist outpatient clinic. The patient was also referred for a consultation with an otolaryngologist for evaluation of the vagus nerve paralysis and its effects on vocal cord function.
- b. Over period of 2 weeks, the patient's symptoms gradually improved. The tongue weakness and voice had returned to normal by the 3 weeks of post-operation and was subsequently discharged from the follow up clinic (figure 1.c).

CONCLUSION

1. While the use of LMAs in general anesthesia is generally safe, other complication such as Tapia syndrome, can occur due to compression or stretch injury during airway management.
2. Although rare, cranial nerve injuries should be considered in every cases when patients present with post-operative dysphagia, hoarseness, or tongue deviation. Early recognition and supportive care often lead to favorable outcomes.
3. Otolaryngologist and anesthesiologists should remain aware of the potential for cranial nerve injuries, even during surgeries that do not directly involve the head or neck. Early intervention with conservative management, including corticosteroids, neurotrophic and rehabilitation, can improve outcomes and promote recovery in cases of nerve injury.

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