Awake Nasotracheal Intubation via Fibreoptic Bronchoscope for Surgical Treatment of Temporomandibular Joint Ankylosis: A Case Report

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ABSTRACT

Temporomandibular joint ankylosis (TMJA) causes immobility due to fusion of the joint. It most often results from trauma or infection, but it may be congenital or a result of rheumatoid arthritis. The condition is very common in children and rarely seen in adults. Administration of effective and safe anesthesia to patients with TMJA often poses a serious challenge during surgical correction. Hence, we report a case of a 68-year-old Nigerian woman with no comorbidities who presented to the Oral and Maxillofacial Surgery clinic of our facility with a 5-year history of progressive limitation of mouth opening associated with a painful left cheek swelling. Examination revealed severely limited mouth opening with an interincisal distance of 6 mm. Computerized tomogram of the jaws and the TMJ showed fusion of the condylar head and the temporal articular fossa on the left TMJ. She underwent gap arthroplasty after successful awake nasotracheal intubation via fibreoptic bronchoscope and recovered uneventfully with no recurrence.

Keywords – TMJ Ankylosis, Intubation, Fibreoptic bronchoscope

INTRODUCTION

Temporomandibular joint ankylosis (TMJA) is the fusion of the head of the mandibular condyle to the glenoid fossa of the temporal bone; a disorder that leads to a restriction of mouth opening from partial reduction to complete immobility of the jaw. Trauma is the major cause of TMJA globally (13–100%). Other causes include local (noma) or systemic infection, systemic autoimmune diseases, forceps delivery, neoplasia, or unknown etiology.[1,2] It presents a serious airway management challenge as rigid laryngoscopy is not possible.[3,4] Administration of effective and safe anesthesia to patients with TMJA requires a flexible fibreoptic bronchoscope, which is the gold standard for the management of anticipated difficult airway. If and where this device is available, trained personnel who are conversant with its use and monitoring equipment are also needed.[3,4] These requirements are not usually met in most facilities in a developing and resource-limited setting like ours.[5]

The aim of this article is to report the first case of awake nasotracheal intubation with flexible video bronchoscope in the management of TMJA in our facility and arguably the first such report in the southwestern region of Nigeria. We affirm the novelty of this case report based on a comprehensive literature review aimed at identifying any previously published documentation on awake fibreoptic intubation for temporomandibular joint ankylosis surgery within the Southwest region of Nigeria. A systematic search was conducted across the following reputable databases: PubMed, Google Scholar, African Journal Online (AJOL), and Scopus. The search items included the following keywords: "Fibreoptic intubation" OR FOI, "Temporomandibular Joint ankylosis" OR "TMJA", "Southwestern Nigeria" OR "Nigeria". Boolean Operators were used to broaden and refine the search (e.g., "FOI AND TMJA AND Nigeria", "Fibreoptic intubation AND Jaw ankylosis AND Southwest Nigeria"). These searches covered all publications up to July 2025, and both case reports and observational studies were reviewed. Our search yielded no published reports that described a case of

fibreoptic intubation for TMJA surgery in Southwest Nigeria.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. Ethical approval was obtained from the institutional review board with approval number ERC/2025/02/11/1213A.

CASE PRESENTATION

A 68-year-old woman presented to the Oral and Maxillofacial Surgery clinic of our facility with a history of progressive limitation of mouth opening of five years' duration, which continued until she was unable to masticate well. There was a history of moderately painful left cheek swelling of a month's duration in association with the retained roots of the lower left mandibular first molar around the onset of the difficulty in opening the mouth. She had undergone forceful jaw exercise in another facility before presentation. There was no history of trauma to the jaws.

Clinical examination revealed no obvious facial deformity. There was no condylar movement on the left side, but limited movement was palpable on the right temporomandibular joint. Mouth opening was severely limited; the interincisal distance measured with a ruler was 6 mm (Fig. 1). The radiologist's report of the computerized tomogram of the jaws and the TMJ revealed expansion, irregularity, flattening, and sclerosis of the condylar process of the left mandible and the mandibular fossa of the squamous temporal bone with associated marked narrowing of the temporomandibular joint space. The left mandible was immobile, but no abnormality was detected on the right TMJ (Fig. 2).

Therapeutic challenge: 3D CT revealed apparent fusion of the condylar head with the temporal articular fossa on the left TMJ (Fig. 2).

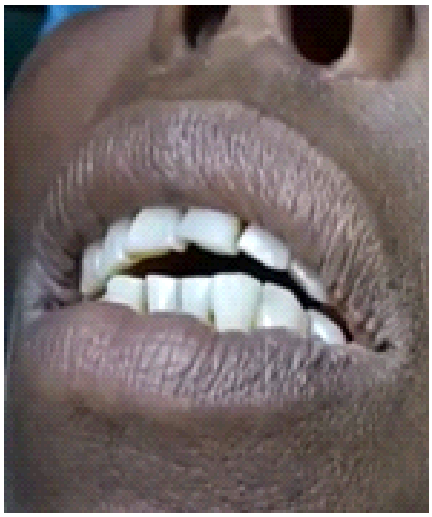

Figure 1. 6mm Pre-op mouth opening

Figure 2: 3D reconstruction of left TMJ from facial CT scan showing fusion of the condyle with the temporal bone

A diagnosis of bony ankylosis of the left TMJ was made. Following anesthetic review, the patient was scheduled for gap arthroplasty under general anesthesia via awake fibreoptic intubation (FOI) guided by fibreoptic video bronchoscope due to the anticipated difficult airway. Armamentarium for tracheostomy was made available as a contingency in case the fibreoptic technique failed. In the operating room, the patient's cooperation was secured after thorough explanation of the FOI procedure. Intravenous atropine (0.5 mg) was administered 30 minutes before the procedure to dry airway secretions. The patient was positioned supine with the head of the table elevated approximately 30 degrees. The right nostril was identified as the most patent. The maximum safe dose of lignocaine was calculated using 7 mg/kg. The right nostril was packed with gauze soaked in 2% lignocaine with 1:200,000 adrenaline for approximately five minutes. Four percent lignocaine containing 0.01% adrenaline was sprayed into the nasal cavity and oropharynx using an atomizer.

A size 6.0 endotracheal tube (ETT) was loaded onto the flexible fibreoptic bronchoscope and passed through the right nostril (Fig. 3) after lubrication with 2% lidocaine gel. The bronchoscope was advanced under video guidance until the epiglottis was visualized. Two milliliters of 4% lignocaine was sprayed through the bronchoscope's port, followed by patient coughing. The bronchoscope tip was advanced between the vocal cords, and an additional spray of 4% lignocaine was administered to anesthetize the larynx and trachea. The tracheal rings and carina were identified (Fig. 4). The ETT tip was lubricated with lidocaine gel and carefully railroaded over the bronchoscope into the trachea, advancing approximately 3 cm above the carina. The procedure was moderately tolerated by the patient. While the

patient remained awake, the endotracheal tube was secured in place. General anesthesia was then induced with intravenous propofol and maintained with isoflurane in 100% oxygen. Muscle relaxation was maintained with intravenous atracurium. Intraoperative analgesia was provided with 600 mg intravenous paracetamol, 75 mg intramuscular diclofenac, and 30 mg intravenous pentazocine.

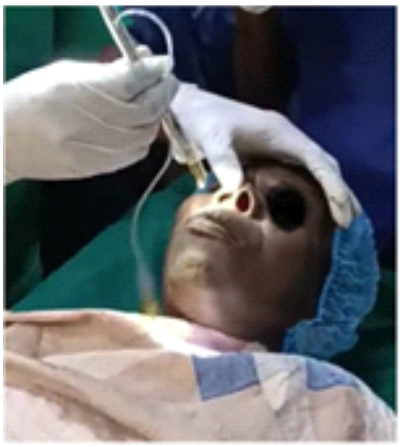

Figure 3: Size 6.0 endotracheal tube loaded the flexible fibreoptic bronchoscope

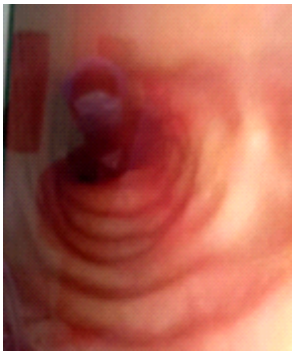

Figure 4:Tracheal lumen visualized after onto successful nasotracheal intubation.

Gap arthroplasty without interpositional material placement was performed via a Risdon (submandibular) incision on the left mandible. A 1 cm segment of the ramus (ramus ostectomy) was removed using a surgical bur and handpiece under copious normal saline irrigation, creating a new functional joint space below the ankylotic mass. An intraoperative mouth opening of 3.5 cm was achieved. Active jaw opening physiotherapy was initiated 48 hours postoperatively using wooden spatulas. The patient was instructed to continue these exercises for at least 12 months following discharge. She attended postoperative follow-up appointments at 2, 4, and 8 weeks, maintaining a 3.5 cm interincisal distance at each visit.

Although the patient relocated to a distant location and could not attend later clinic appointments, she remained engaged through regular telephone contact. During these calls, she consistently reported absence of pain, ability to chew solid foods, and compliance with postoperative jaw exercises. When the patient returned for evaluation three years postoperatively, she presented with no recurrence of mouth opening limitations. Clinical examination demonstrated optimal jaw function and an improved interincisal distance of 4.0 cm.

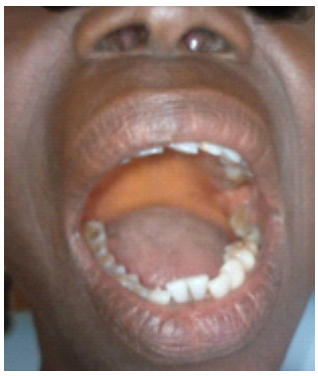

Figure 5: mouth opening one week post-op

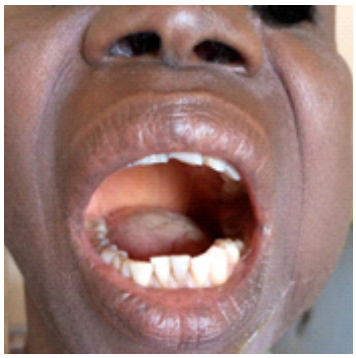

Figure 6: Mouth opening 3 years postoperatively

DISCUSSION

Findings: Temporomandibular joint ankylosis is common in children and young adults, but it rarely presents in the elderly population like this case.[2] Braimah et al. reported that the bulk of the patients in their recent study were between ages 1–30 years.[3] Trauma is also said to be the commonest cause, which unlike this case that was associated with infection around the joint.[6] The main reason the patient presented was problem with feeding, as there was neither remarkable facial deformity nor obstructive sleep apnea syndrome that could be associated in younger age group. The severely limited mouth opening implied a potentially difficult airway which is typical of TMJA. The following are the non-surgical options available for intubating a patient with minimal or nonexistent mouth opening: blind nasal intubation, retrograde intubation using cricothyroid puncture, or fibreoptic intubation which is the gold standard.[4] Blind nasal intubation was not considered in this case because it has a lot of

disadvantages which include; high failure rate even in the hands of an expert, bleeding due to local trauma, secretions in the airway and distorted tissue anatomy which makes it even more difficult.[7] Tracheostomy which happens to be the last option and mostly used airway management option for TMJA until recently was not preferable in this case due to the attendant limitations and complications associated, like subcutaneous emphysema[8,9] which has been reported to be a potentially catastrophic postoperative complication of tracheostomy that the authors witnessed in another patient before this particular case. Coincidentally, a flexible fibreoptic bronchoscope was just recently procured by the management of the hospital around the time the patient presented. This prompted the plan to do awake fibreoptic nasotracheal intubation.

The use of fibreoptic bronchoscope for TMJA surgery has not been well reported in Nigeria especially in the southwest region as at the time this patient was managed. This is not unconnected with the unavailability of the necessary devices even in most tertiary hospitals in Nigeria. Nsofor et al.[5] found that only 4.1% of respondents who were anesthetists in their study that was published 10 years ago had video laryngoscopes in their centers. This value was very low when compared with 81% availability in a Canadian program.[5,10] Although Nigeria is a developing country unlike Canada, video laryngoscopes, fibreoptic bronchoscope and other sophisticated airway tools are affordable for training in our tertiary institutions. Routine practice with a wide variety of airway devices will only be possible when they are readily available in all operating rooms. Braimah et al. recently reported a change of trend in their management of the airway of patients with TMJA such that tracheostomy has been replaced with flexible fibreoptic tracheal intubation in their center leading to reduced morbidity and mortality recorded in such patients.[3]

The few reports on FOI in the treatment of TMJA from Nigeria is from the Northern part of the country, a region known to witness a larger number of cases of TMJA.[3,11] Lack of armamentarium and insufficient number of trained personnel has been a major reason why FOI has not been popular in this part of the world. As reported by Braimah et al.[3], followed by intensive in-house training of many others, especially resident doctors are practical ways of bridging the gap of skill and manpower in the utilization of modern techniques for the management of difficult airways in our hospitals. Gap arthroplasty was done as a surgical option for this patient as it provides stable and satisfactory postoperative outcomes.[2,11] which was true of this case as the patient's mouth opening stabilised and even improved 3 years after the surgery.

Implications: Awake nasotracheal intubation via fibreoptic bronchoscope is a viable option for the TMJA surgery even in our resource limited setting in Nigeria. It can be tolerated by adult patients and associated with minimal complications.

Trade-offs (limitations): Being a single case report and the patient's inability to attend scheduled follow-up visits are notable limitations of this report.

Take home (conclusion): Fibreoptic intubation as the gold standard for difficult airway accessibility like in surgical correction of temporomandibular joint ankylosis has low risk of complication. It can be performed by trained anaesthetists and should be available as the airway management option for oral and maxillofacial surgery procedures especially TMJA surgeries, at least in teaching or specialist hospitals in developing countries like Nigeria. Managers of health institutions should be encouraged to prioritize the procurement of armamentarium and consumables for this procedure.

Expectation for future research: Future larger multicentre study should explore the suitability and tolerability of awake fibreoptic intubation for all age groups including children.

Recommendation: Managers of health institutions in Nigeria especially in the Southwestern region should be encouraged to prioritize the procurement of armamentarium and consumables for nasotracheal intubation via fibreoptic bronchoscope.

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Conflicts of interest: The authors declare no conflicts of interest.

REFERENCES

1. GP Lanje Shrikant. Anesthetic management of temporomandibular joint ankylosis in a pediatric patient. Int J Health Sci Res. 2015; 5(12):433-436.
2. Vasconcelos BCE, Bessa-Nogueira RV, Cypriano RV. Treatment of temporomandibular joint ankylosis by gap arthroplasty. Med Oral Patol Oral Cir Bucal 2006;11:E66-9.
3. Braimah RO, Taiwo AO, Ibikunle AA, et al. Changing trend of airway management in patients with temporomandibular joint ankylosis; A 9year retrospective appraisal in Sokoto, Northwest Nigeria. Trends in Anesthesia and Critical Care 2023; 53:101311

4. Bhalerao N, Paunikar S, Wanjari D, et al. Temporomandibular Joint Ankylosis: Anesthetic Challenge. Cureus 2024;16(2): e54379.

5. Nwasor EO, Olateju SO, Kalu QN. Airway management: A survey of training and practices of Nigerian anesthetists. Niger J Clin Pract 2014;17:569-72

6. Anyanechi CE, Osunde OD, Bassey GO. Management of Extra-Capsular Temporo-Mandibular Joint Ankylosis: Does Conservative Approach to Treatment Have a Role? J. Maxillofac. Oral Surg. 2015; 14(2):339–343.

7. A. Zemedkun, D. Angasa, N. Gobena, T. Regasa, Blind nasal intubation as an alternative airway management modality for bilateral temporomandibular joint ankylosis in a resource constrained set-up: a clinical case report, Int. J. Surg. Open 42; 2022: 100467, 1-4.

8. Alshoubi A. Mathews A. Subcutaneous emphysema following open tracheostomy © Am J Case Rep 2022; 23: e937102.

9. Cipriano A, Mao ML, Hon HH, Vazquez D, Stawicki SP, Sharpe RP, Evans DC. An overview of complications associated with open and percutaneous tracheostomy procedures. Int J Crit Illn Inj Sci. 2015;5(3):179-88

10. Pott LM, Randel GI, Straker T, et al. A survey of airway training among U. S. and Canadian anesthesiology residency programs. J Clin Anesth 2011;23:15-26.

11. Ajike SO, Omisakin OO. Temporomandibular Joint Ankylosis in a Nigerian Teaching Hospital. West Indian Med J 2011; 60 (2): 172.