International Journal of Research in Medical Sciences
Xavier A et al. Int J Res Med Sci. 2026 Sep;14(9):4096-4100
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20263134

Case Report

Awake oral fibreoptic intubation with dexmedetomidine sedation in severe maxillofacial trauma following bear mauling: a case report

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Received: 19 July 2026
Revised: 20 August 2026
Accepted: 21 August 2026

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ABSTRACT

Awake fibreoptic intubation (AFOI) is considered the gold standard for securing the anticipated difficult airway. Sedation should provide comfort while preserving spontaneous ventilation and airway reflexes, with dexmedetomidine offering cooperative and arousable sedation. A 57-year-old male from a hilly district in North-East India presented with extensive facial lacerations and near-mutilation following a bear attack. Following resuscitation and primary wound closure, he was posted for emergency left eye evisceration. Airway assessment revealed restricted mouth opening with an un-assessable Mallampati class, while associated bony injuries had not been excluded. Communication was severely limited by facial trauma and a language barrier, necessitating a trained translator. Anticipating difficult bag-mask ventilation and intubation, awake oral fibreoptic intubation under dexmedetomidine sedation with airway blocks was planned. After high-risk consent, dexmedetomidine was administered with a 50-µg bolus followed by 0.4 µg/kg/h infusion. Antisialagogue premedication and airway anaesthesia using glossopharyngeal, bilateral superior laryngeal and transtracheal lignocaine blocks were provided within recommended dose limits. Oral AFOI using an armoured endotracheal tube was successfully achieved on the second attempt. Anaesthesia was subsequently maintained with inhalational agents and intermittent vecuronium. After reversal with sugammadex, extubation was performed when the patient was fully awake and obeying commands. This case highlights the role of dexmedetomidine-assisted awake oral fibreoptic intubation with airway blocks in severe maxillofacial trauma when the nasal route is unsuitable, emphasizing meticulous consent, documentation and management of language barriers in emergency anaesthesia.

Keywords: Awake fibreoptic intubation, Difficult airway, Maxillofacial trauma, Dexmedetomidine, Airway nerve block, Consent, Communication barrier

INTRODUCTION

Awake fibreoptic intubation (AFOI) is widely regarded as the gold standard for securing the airway in patients with anticipated difficult airway, allowing maintenance of spontaneous ventilation while the airway is instrumented.[1,2] Successful AFOI depends on careful patient preparation, adequate airway anaesthesia and optimal sedation to ensure comfort without compromising airway patency or protective reflexes.[1]

Dexmedetomidine provides cooperative sedation, analgesia and sympatholysis with minimal respiratory depression, and has been successfully used to facilitate AFOI in a variety of difficult airway scenarios, including cervical spine pathology and anticipated difficult intubation.[3-5] Severe maxillofacial trauma, whether due to road traffic accidents, interpersonal violence or animal mauling, poses additional challenges because of distorted anatomy, limited mouth opening, bleeding, oedema and the potential for associated cervical spine and airway

injuries.[5,6,10] In such situations, conventional laryngoscopy may be hazardous, and AFOI via oral or nasal route is often preferred.[1,5,6]

Case reports remain an important vehicle for sharing practical strategies for airway management in rare or complex situations, particularly in resource-constrained settings.[7] At the same time, Indian literature emphasises robust documentation, valid consent and clear communication as core components of safe anaesthesia practice and medico-legal risk reduction.[8,9] This case report describes the anaesthetic management of a patient with severe facial trauma following a bear attack, in whom awake oral fibreoptic intubation under dexmedetomidine sedation was performed in the presence of significant communication barriers.

CASE REPORT

A 57-year-old male farmer from a hilly district in North-East India was referred to our tertiary care centre emergency department from a district hospital with alleged history of bear attack (Figure 1). On arrival, he had multiple deep, irregular lacerations and avulsive injuries over the face, with near-mutilation leading to marked facial disfigurement and oedema. He was haemodynamically stable but had sustained significant blood loss; initial haemoglobin was 7.2 g/dL. Primary resuscitation at our centre included transfusion of packed red blood cells, fresh frozen plasma and platelets in a 1:1:1 ratio, guided by clinical assessment.

Figure 1: Preoperative image of the patient.

Despite the extensive facial injuries, the airway was patent, there was no stridor or respiratory distress, and oxygen saturation remained within normal limits on supplemental oxygen. Therefore, no emergent airway intervention was undertaken at that stage. The patient underwent surgical debridement and primary closure of facial wounds under surgical care and was admitted to the intensive care unit (ICU) for monitoring. The left eye had sustained irreversible injury, and the ophthalmology team planned emergency evisceration once the patient was haemodynamically stabilised.

He was subsequently posted for left eye evisceration in the emergency operating theatre. During pre-anaesthetic evaluation, communication was challenging for two reasons: the patient could not articulate speech adequately because of facial trauma and recent sutures, and he belonged to a Naga tribal community residing in a remote area with a distinct language different from the commonly spoken regional languages. A trained hospital staff member fluent in his dialect was enlisted as translator. With the help of the translator, history was obtained and the anaesthetic plan was explained.

The patient had no known systemic comorbidities, with the exception of chronic alcohol use and smoking; his last alcohol intake was one week prior to admission. There was no history suggestive of cardiovascular, respiratory or neurological disease. Repeat investigations showed haemoglobin 10.1 g/dL with otherwise unremarkable routine laboratory results.

Airway examination revealed restricted mouth opening of approximately one finger breadth. Modified Mallampati score could not be reliably assessed because of pain, swelling and limited mouth opening. The thyromental distance and neck movements were within normal limits, and there were no clinical signs of cervical spine injury. However, detailed imaging of nasal bones and paranasal sinuses was not available at the time of surgery; therefore, nasal and associated bony injuries could not be excluded. Given the extensive facial lacerations, restricted mouth opening and uncertainty about internal airway injuries, difficult bag-mask ventilation and tracheal intubation were anticipated.

A multidisciplinary discussion between anaesthesiologists and surgeons concluded that the safest approach would be awake oral fibreoptic intubation with maintenance of spontaneous ventilation, followed by general anaesthesia. Because possible nasal fractures and skull base involvement had not been ruled out, the nasal route was avoided. With assistance from the translator, the awake intubation technique, its rationale and potential complications were explained to the patient in his native language, and he was encouraged to ask questions. A specific high-risk written consent for anaesthesia and the planned AFOI was obtained, in addition to consent for surgery, in keeping with Indian recommendations on informed consent.

In the operating theatre, standard ASA monitors (electrocardiogram, non-invasive blood pressure, pulse oximetry and temperature) were applied. An intravenous line was secured, and baseline vitals were recorded. The translator remained present throughout the awake intubation phase to facilitate communication and reassure the patient. Premedication consisted of intravenous glycopyrrolate 0.2 mg to reduce secretions. A senior

anaesthesiologist with experience in fibreoptic intubation was present in view of the anticipated difficulty.

A dexmedetomidine infusion was commenced at 0.4 µg/kg/h after a bolus of 50 µg to provide cooperative, arousable sedation while preserving spontaneous breathing and airway reflexes. Supplemental oxygen was administered via facemask. The level of sedation was titrated clinically; the patient remained drowsy but easily arousable, obeyed simple commands communicated through translator and maintained stable haemodynamics.

Airway anaesthesia was achieved using a combination of topical and nerve block techniques, ensuring that the total lignocaine dose remained within recommended limits to minimise the risk of systemic toxicity. Glossopharyngeal nerve block was performed by spraying 10% lignocaine onto the base of tongue, tonsillar pillars and posterior pharyngeal wall, to the extent allowed by the distorted anatomy. Bilateral superior laryngeal nerve blocks were administered at the level of the greater cornua of the hyoid bone using 2 ml of 2% lignocaine on each side. A transtracheal block (recurrent laryngeal nerve) was performed by instilling 2 ml of 2% lignocaine through the cricothyroid membrane, eliciting a cough that dispersed the local anaesthetic over the infraglottic mucosa.

After confirming adequate airway anaesthesia (diminished gag and coughing on gentle suctioning), an adult fibreoptic bronchoscope was inserted orally. During the first attempt, the patient exhibited slight discomfort and coughing as the scope advanced through the oropharynx. Additional 10% lignocaine spray was cautiously applied, and a brief pause allowed for further topicalisation. Care was taken not to exceed the maximum allowable lignocaine dose. On the second attempt, the bronchoscope was advanced under direct vision, navigating around oedematous and distorted oropharyngeal structures until the epiglottis and vocal cords were visualised. The scope was then passed through the glottis to the level of the carina.

A 7.0 mm cuffed armoured (flexometallic) endotracheal tube, preloaded over bronchoscope, was railroaded gently into trachea (Figure 2-4) Tube placement was confirmed by direct visualisation of carina during withdrawal of the bronchoscope and by capnography and bilateral chest auscultation. Throughout procedure, patient maintained spontaneous ventilation and stable oxygen saturation without significant haemodynamic perturbation.

Once the airway was secured, the dexmedetomidine infusion was discontinued. Intravenous fentanyl 2 µg/kg was administered, and anaesthesia was deepened with a mixture of oxygen, nitrous oxide and sevoflurane. Neuromuscular blockade was achieved with vecuronium 0.1 mg/kg initially, followed by intermittent boluses as required. Mechanical ventilation was provided using a lung-protective strategy as per institutional protocol. The ophthalmic procedure proceeded uneventfully, with stable intraoperative haemodynamics.

At the completion of surgery, inhalational agents were discontinued. Neuromuscular blockade was reversed with sugammadex, chosen to ensure reliable and rapid recovery of muscle strength in this high-risk airway. After confirming adequate spontaneous ventilation, full reversal and ability to obey commands communicated via the translator, the trachea was extubated carefully. The patient was shifted to the post-anaesthesia care unit for observation and subsequently transferred to the ICU once the modified Aldrete score criteria were satisfied. The postoperative course was uneventful with respect to airway and respiratory status.

Figure 2: After securing the airway.

Figure 3: Bronchoscopy being performed.

Figure 4: Bonchoscopy being performed.

DISCUSSION

This case illustrates the successful use of awake oral fibreoptic intubation with dexmedetomidine-based cooperative sedation and airway nerve blocks in a patient with severe maxillofacial trauma following animal mauling, in the context of significant communication and language barriers. AFOI is recommended as the preferred technique in many difficult airway algorithms, especially when mask ventilation and direct laryngoscopy are expected to be difficult and where preservation of spontaneous breathing is desirable.[1,2] Maxillofacial trauma with restricted mouth opening, facial oedema and possible airway distortion falls squarely into this category.[1,5,6,10]

In patients with facial fractures requiring intermaxillary fixation or in those with severe craniofacial injuries, fibreoptic intubation- via oral or nasal route- has been shown to improve airway safety compared with blind techniques.[5,6,10] Nabil et al reported successful awake fibreoptic orotracheal intubation in a patient with severe craniofacial trauma during an earthquake scenario, emphasising the role of meticulous preparation and interdisciplinary coordination.[6] In the present case, nasal and skull base fractures had not been ruled out, prompting us to avoid the nasal route and opt for oral AFOI. The combination of restricted mouth opening and distorted anatomy demanded careful titration of sedation and local anaesthesia to maintain cooperation and spontaneous ventilation.[1,3,5]

Dexmedetomidine is a selective α2-adrenergic agonist that provides sedation, anxiolysis, analgesia and sympatholysis with minimal respiratory depression, characteristics ideal for awake intubation.[3-5] In a randomised study simulating cervical spine injury, dexmedetomidine-based conscious sedation provided optimal conditions for AFOI while preserving the ability to perform postoperative neurological examination.[3] Indian authors have described the use of dexmedetomidine via intravenous and nebulised routes as an adjuvant to lignocaine for AFOI, reporting improved patient comfort, stable haemodynamics and acceptable intubating conditions.[4,5] In our patient, a relatively low infusion dose of dexmedetomidine (0.4 µg/kg/h) together with adequate airway blocks was sufficient to achieve cooperative sedation, avoiding oversedation and the risk of airway obstruction in the setting of an unsecured airway.[3-5]

Adequate upper airway anaesthesia is critical for patient tolerance of AFOI. Various techniques, including topical sprays, viscous gargles, nebulisation, translaryngeal injection and regional nerve blocks, have been described.[1,2,5,6,11] Ultrasound-guided bilateral superior laryngeal nerve block and transtracheal recurrent laryngeal nerve block provide dense anaesthesia of the supraglottic and infraglottic structures using relatively small doses of lignocaine, and have been shown to reduce intubation time and improve patient comfort compared with nebulisation alone.[1,6,11] We used a combination of glossopharyngeal topicalisation, bilateral superior laryngeal blocks and transtracheal injection similar to those described in the literature, taking care to remain within a safe cumulative lignocaine dose.[1,5,6,11] The need for a second attempt and minor coughing during initial scope advancement underscore the importance of allowing sufficient time for topical agents to take effect and of titrating supplementation judiciously.

Beyond technical considerations, this case underscores several relevant ethical and communication aspects. Indian law and professional guidance are clear that consent must be informed, procedure-specific and obtained by the treating doctor, and that merely obtaining a signature on a form is not sufficient.[8,9] In patients with language barriers, consent should preferably be taken in the patient's vernacular language, with the assistance of an interpreter if needed, and the process should be carefully documented.[8,9] In our patient, speech limitation due to facial trauma compounded the linguistic barrier; involving a trained translator throughout pre-operative counselling, consent and awake intubation not only fulfilled legal requirements but also improved patient understanding and cooperation.

Proper documentation of the anaesthetic plan, difficult airway management and any critical events is essential for continuity of care and medico-legal defence.[7,8] Chhabra et al highlighted how inadequate documentation of an intraoperative critical event in a previous surgery complicated future anaesthetic decision-making and advocated meticulous recording of anaesthetic techniques and complications.[8] In difficult airway cases, providing the patient with written information or an airway alert card has been recommended so that future caregivers are aware of the airway challenges encountered and strategies that proved successful.[7]

CONCLUSION

This case demonstrates that awake oral fibreoptic intubation under dexmedetomidine-based cooperative sedation, combined with effective airway nerve blocks, can provide a safe and reliable approach to anticipated difficult airway management in severe maxillofacial trauma when the nasal route is unsuitable or potentially hazardous. Preservation of spontaneous ventilation, careful titration of sedation and adequate airway anaesthesia were crucial to successful intubation without hypoxaemia or haemodynamic instability. Equally important, the case highlights that effective communication, use of a trained interpreter, procedure-specific informed consent and meticulous documentation are integral components of safe emergency anaesthesia, particularly when trauma-related speech impairment and language barriers coexist. A multidisciplinary approach, experienced personnel and a well-planned difficult airway strategy remain essential to achieving a favourable outcome in such complex cases.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Xavier A, Fernandez S. Awake oral fibreoptic intubation with dexmedetomidine sedation in severe maxillofacial trauma following bear mauling: a case report. Int J Res Med Sci 2026;14:4096-100.