

Case Report

Anaesthesia in Transoral Odontoidectomy: A First Case Report in Zambia

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ABSTRACT

Transoral odontoidectomy is one of advanced neurosurgical technique used for management of C1-C2 dislocation causing ventral compression of the cord. This surgery requires mutual cooperation between surgical and anesthetic team to reduce in-hospital morbidity/mortality rate and ensure a positive outcome of the procedure. There are limited amounts of publication the world literature regarding anesthetic management during the surgery and not at all in Sub-Saharan region.

We report a first case report of this surgery in the Republic of Zambia in order to encourage further research in neuroanesthesia and share our experience with other medical professionals.

CASE REPORT

An 11-year-old adolescent was admitted to hospital with symptoms of moderate-severe pain in the neck and restrain of head movements. According to patient's anamnesis, it occurred during morning straining physical exercises. On physical examination no other systemic disturbances were found. Routine blood investigations, coagulation profile and an electrocardiogram were within normal limits. Cervical X-ray imaging (flexion and extension) and C-spine CT-scan showed atlanto-axial dislocation (C1-C2 dislocation) and ventral spinal cord compression (Fig.1 and Fig.2). In a couple of days she was scheduled for transoral odontoidectomy.

Figure 1: Plain X-ray of the neck showing atlanto-axial dislocation (in extension)



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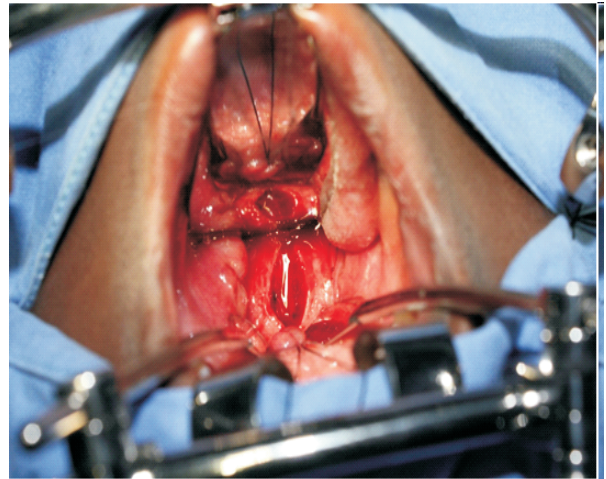
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Figure 2: Plain X-ray of the neck showing atlanto-axial dislocation (in flexion)



The patient was preoxygenated over 3 min by 100% oxygen and anesthetic management was initiated with IV propofol 2mg/kg, IV fentanyl 3 mcg/kg, sevoflurane 2% and IV vecuronium 0.1 mg/kg. Nasotracheal intubation with cuffed endotracheal tube (ETT) 6.0 was successfully performed with the first attempt. Cormack-Lehane was grade I. ETT was well fixed with adhesive tape and double-checked by another anesthesiologist. Nasogastric tube (16 Fr) was inserted as well and strapped. Maintenance was achieved with total intravenous anesthesia (TIVA) by propofol 6 mg/kg/h, fentanyl 2 mcg/kg/h, vecuronium 0.02 mg/kg/h and sevoflurane 1% (FiO₂ 0.6) on volume assisted-controlled ventilation. The posterior pharyngeal wall was infiltrated with 1% lidocaine and 1:200,000 adrenaline. A 3 cm longitudinal midline incision was made in the posterior pharyngeal mucosa using a surgical blade (Fig.3).

Figure 3: Image shows an incision of posterior pharyngeal wall following infiltration with 1% lidocaine and adrenaline 1:200,000



Throughout of the surgical intervention, hemodynamics and respiratory parameters were within normal range. At the end of the first and second phases of the surgery (odontoidectomy and posterior fixation, accordingly), the patient was partially awaked by the surgeon's request to evaluate neurological status (motor response) of the patient and following positive observations, she was anesthetized again by bolus anesthetic intravenous administration. The patient was transferred to the Intensive Care Unit (ICU) for further prolonged ventilation. Intraoperative blood loss was about 350 ml.

During oral examination in the ICU, moderate oropharyngeal edema immediately following surgery was noticed. She was ventilated overnight and uneventfully extubated the next morning. Repeated oral examination showed mild localized edema around surgical wound. Enteral nutrition was received by nasogastric tube over next 5 days. On next day she was transferred out to the surgical ward and in 5 days was successfully discharged from the hospital.

DISCUSSION

Transoral odontoidectomy is the essential surgical intervention directed to treat an odontoid fracture and irreducible subluxation causing ventral compression of the cord.^{1,2,3} Dislocation due to instability of atlanto-axial joints leads to compression of vital cervicomedullary neural structures that lie underneath and results in neurological disability. A minor trauma may precipitate quadriplegia, respiratory arrest and even death.⁴

Therefore, this surgical intervention is vital for indicated patients and requires congruence between surgical and anesthetic team in order to provide an optimal pre-, intra- and postoperative plan.^{5,6} Following a comprehensive and detailed description of the procedure by the surgeon, our anesthetic plan was as follows: complete biochemical and radiologic examination of the patient; nasotracheal intubation as the best technique to minimize the interference with the surgical field; nasogastric intubation to ensure an adequate postoperative enteral nutrition and protocol for weaning off with further extubation.

We used an optimal and more controllable type of anesthetic such as total intravenous anesthesia because of several reasons: more rapid recovery for neurological assessment between phases of surgery, little evidence of organ toxicity and reduced incidence of postoperative nausea and vomiting.⁷

There was no topical application of steroids in view of lack of any benefits in their uses.² Nonetheless we instituted IV hydrocortisone 100 mg twice a day over 2 days immediately after skin closure and thereafter due to traumatizing aspects of the surgery (pharyngeal oedema). Postoperative analgesic management with intravenous agents (IV tramadol 50 mg TDS and IM diclofenac 50 mg TDS) was administered which ensured pain-free and comfortable period of time over next 5 days and allowed more safer and rapid extubation of the patient.

We suggest skillful surgical technique along with contemporary anesthetic management (TIVA) and optimal pain management have led us to successful and prompt complete patient's recovery without any hospital-related complications. The follow-up X-ray imaging in 5 days has been done (Fig.4).

Figure 4: Plain X-ray of the neck showing Rnadsford loop fixation in 5th postoperative day



CONCLUSION

Transoral odontoidectomy seems to be one of the advanced neurosurgical technique required a number of components for a safe and successful outcome such as surgeon's skills and experience, availability of proper neurosurgical facilities and good pre-, peri- and postoperative anesthetic plan. It stands to reason a lack of one of these components may have some negative impact on the quality of care. Authors weighted all risks and benefits of the surgical procedures and performed the first case in the Republic of Zambia. There are no published works regarding anesthetic management for this procedure in Sub-Saharan Africa and we hope our case report will give an impetus for further implementation of this surgical intervention in this region.

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