



# Video Laryngoscopy as an Aid in Difficulty Airway Management for Huge Hydrocephalus: A Case Report

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## ABSTRACT

Hydrocephalus is a clinical condition with abnormal and excessive accumulation of cerebrospinal fluid within the ventricular cavity. The progressive enlargement of the head with delay in presentation may result in huge hydrocephalus usually in infant. We report a case of huge hydrocephalus in a 6-month old infant with head circumference of 72 cm, who was planned for ventriculo-peritoneal shunt surgery with anesthetic consideration for difficult intubation because of large head size and intra operative positioning. Thorough and well-coordinated perioperative and intraoperative management between surgeon and anaesthesiologist will reduce morbidity and mortality, thereby improving the surgical outcomes.

**Keywords:** Hydrocephalus, infants, huge, ventriculo-peritoneal shunt

## I. INTRODUCTION

Hydrocephalus is a clinical condition with abnormal and excessive accumulation of cerebrospinal fluid within the ventricles. This accumulation is due to imbalance between production and absorption of cerebrospinal fluid within the brain with resultant raised intracranial pressure (1). Head enlargement occurs in childhood and with the progression of the hydrocephalus, head size and circumference increases (1). The typical description of a huge hydrocephalus is when the circumference of the head is bigger in size than the length of the infant. This type of presentation is commonly seen in a remote setting of under-developed and developing nations where there is poor knowledge of the condition and poor access to care that causes delay in presentation of an infant with congenital hydrocephalus.

Hydrocephalus cases especially huge ones require a thorough clinical and perioperative anaesthetic evaluation to rule out other congenital abnormality. This evaluation and monitoring also help to prevent complications from the hydrocephalus and to overcome anticipated difficult airway management. These kind of cases will pose big challenges to surgeon and anaesthesiologist during the course of management.

We present this case to discuss the challenges of perioperative management of an infant with huge hydrocephalus in our facility.

## Case presentation

We present a six month old female infant with progressive abnormal head enlargement post ventriculo-peritoneal shunt removal. She had initial surgery 3 months earlier for congenital hydrocephalus. The shunt got infected following febrile illness and otitis media. She was treated and was subsequently evaluated fit for re-insertion of ventriculo-peritoneal shunt.

## Anaesthetic evaluation

A female infant, afebrile, not pale, anicteric, acyanosed and not dehydrated. The pulse rate was 130bpm with 99% oxygen saturation in room air. There was an enlarged head with craniofacial disproportion in favour of cranium. The occipito-frontal circumference (OFC) was 72cm with sunset eyes and sutural diasthesis (Figure 1). No other congenital abnormality seen.

The last surgery was done under general anaesthesia maintained on isoflurane and the procedure was uneventful. No any comorbidity or allergy seen. The packed cell volume was 38% and the renal function was



optimal.

Consent for re-do ventriculo-peritoneal under general anaesthesia with endotracheal tube was obtained from the parents.



#### Intraoperative care

Anesthetic machine and equipment were checked. She had premedication with atropine and pre-oxygenation was done. She was induced with incremental dosing of halothane in oxygen until deep plane of anaesthesia was reached. The first two attempts of intubations by conventional laryngoscopy failed. However, the third attempt was undertaken with video laryngoscope and it was successful. A 2.5mm endotracheal tube was placed into the trachea (Figure 2). The patient was subsequently positioned with improvised head ring and shoulder roll. The operative preparation was done and patient had ventriculo-peritoneal shunting. The procedure was tolerated. The post-operative care and period was uneventful, she was discharged for follow up.



Figure 2: Intraoperative picture of the patient

## II. DISCUSSION

Congenital hydrocephalus is a condition present at birth or develops shortly after birth, characterized by an abnormal accumulation of cerebrospinal fluid (CSF) within the brain's ventricular system. This

accumulation causes the ventricles to enlarge, exerting pressure on the brain, potentially leading to developmental and neurological problems. In patient with huge hydrocephalus, because of the risk and potential difficult airway and possible high failure rate with conventional laryngoscopy (1), administration of anesthesia and airway management in such patients requires the availability of flexible fiberoptic bronchoscope. (2)

However, many facilities especially in developing countries are lacking either the necessary skills or equipment or both. Video laryngoscopy and intubation may be utilized as an alternative options for airway management of these patients with a proven success rate compared to conventional laryngoscope.(3) This success is what we experienced in our patient after initial failed intubation attempts with conventional laryngoscope.

## III. CONCLUSION

Infant with huge hydrocephalus present with challenges during peri-operative and intra-operative period but with a well anticipated and coordinated intervention, good and safe outcome is achievable. Use of video laryngoscope to undertake oro-tracheal intubation can be utilized for cases of huge hydrocephalus to improve the success of laryngoscopy and intubation.

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