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ANAESTHETIC MANAGEMENT OF A PATIENT WITH LOWER TRACHEAL STENOSIS FOR TRACHEOSTOMY - A CASE REPORT

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Introduction

The adult trachea is between 10 and 13 cm long, with an average diameter of 2.3 cm coronally and 1.8 cm sagittally in males and 2.0 cm coronally and 1.4 cm sagittally in females. It has a circular, ovoid, or triangular cross-section. Rare and potentially fatal, tracheal stenosis is characterised by aberrant tracheal luminal narrowing. Numerous benign or malignant factors could be to blame. We describe the anaesthetic management of a patient with post intubation tracheal stenosis posted for tracheostomy.

Case report

A 23-year-old male patient with special needs was admitted with a change in voice and noisy breathing for 5 weeks. He has been on treatment for seizure disorder since he was 10 years old and was on T. Carbamazepine 400 mg twice daily, T. Clobazam 10 mg twice daily, T. Leviteracitam 1g twice daily, and T. Lacosamide 100 mg twice daily at the time of admission. There was an episode of status epilepticus seven weeks ago, following which he was intubated and mechanically ventilated for two weeks. Since then, the bystanders have noticed change in voice, stridor as well as breathing difficulty that has progressed over the past month. After admission to our hospital, he had several episodes of generalized tonic clonic seizures, recurring almost every 5 minutes and lasting for about 3 minutes, which were medically managed.

CT scan of Thorax revealed luminal narrowing of trachea at the level of T1 vertebral body for a length of 26 mm with minimum tracheal diameter of 9x4mm. Oxygen saturation under room air was 80%; with oxygen via simple facemask it improved to 92%. Pulmonary function tests could not be performed owing to his inability to comprehend the steps. The treatment options include tracheal dilatation , tracheal stent placement [1] and tracheal resection and reconstruction. Our patient had hypoxia to the extend that it resulted in recurrent seizures. Hence tracheostomy was planned since our primary aim was to maintain normoxia and thereby control of seizure.

On the eve of surgery, he was re-examined. Written informed high risk consent mentioning the possibility of failure in placing both endotracheal and/or tracheostomy tube, hypoxia and post operative elective ventilation was taken. NPO guidelines were advised.

While in the operation theatre, he had several episodes of seizure, which was managed with inj. Midazolam 2 mg and Inj. Thiopentone sodium 250mg intravenously. Due to seizures occurring almost every 5 minutes, prevention of aspiration as well as placing a definite airway was our primary goal, which is why we opted for General anaesthesia. However, due to the location and extent of airway narrowing, we were not sure about the success of intubation. So the presence of ENT and thoracic surgeon was ensured for emergency tracheostomy in case intubation fails. He was then intubated using injection Succinyl choline 75 mg with a size 5.0 microlaryngeal tube. After adequate airway was established, injection Vecuronium 5 mg was given intravenously. Following this, tracheostomy was performed between 3 and 4 tracheal rings using a No. 7 Portex tracheostomy tube. Post-procedure, neuromuscular blockade was reversed and the patient was maintained on spontaneous ventilation with a T piece connected to the tracheostomy tube. His condition improved drastically with no further episodes of seizure and maintenance of oxygen saturation without oxygen supplementation.

Discussion

Tracheal stenosis can occur due to several causes like malignancy, trauma, infections , chronic inflammatory diseases and collagen vascular diseases [1]. Prior manipulation of the trachea in the form of intubation is a very common cause for the same [2],[3].

Ventilation strategies in a case of tracheal stenosis should be tailored to the patient according to the level and extend of stenosis and the minimum tracheal diameter .The various modalities include the use of traditional endotracheal tube, high frequency jet ventilation [4] , supraglottic airway device [5] as well as extra corporeal membrane oxygenation [6][7]. When the constricted area is far below the subglottic region, using a traditional endotracheal tube or supraglottic airway device for maintenance of airway prior to tracheostomy becomes inadequate since the level of obstruction may lie below the distal end of the endotracheal tube or supraglottic airway device. This can result in inadequate ventilation and raised airway pressures.

Our patient had luminal narrowing of trachea well below the glottis at the level of T1 vertebral body with a minimum tracheal diameter of 4mm in the anteroposterior axis. Intubation with a standard adult size endotracheal tube would have been difficult due to the decrease in lumen size. This necessitated the use of smaller sized endotracheal tube. But pediatric endotracheal tube has shorter length compared to adult tube . So it was necessary to use a tube with smaller diameter and similar length as compared to adult tube. Hence, we opted for a relatively easy airway management strategy for managing this case i.e; the use of Microlaryngeal endotracheal tube.

Microlaryngeal endotracheal tube is available in sizes 4.0, 5.0 and 6.0 mm ID with a cuff diameter resembling size 8 mm ID endotracheal tube. It is useful in Microlaryngeal surgeries as well as in cases where there is significant airway stenosis. The use of Microlaryngeal tube helped in easy negotiation through the stenotic area as well as facilitated optimum ventilation.

To conclude, anaesthetic management of a case of tracheal stenosis depends on the level and extend of stenosis. Establishment of airway is of utmost importance and could be done using several methods. The use of Microlaryngeal tube is advantageous as the thinner tube helps in easy negotiation through the lesion and the increased length ensures that the stenotic area is bypassed thus ensuring adequate ventilation.

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