

## CASE REPORT

## Difficult Intubation in Pediatric Due to Vocal Cord Granuloma: A Case Report

WINNIE WONG ST, NIK MUHAMAD NA

*Department of Emergency Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Kuala Lumpur, Malaysia*

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### ABSTRAK

*Granuloma pita suara (VCG) ialah luka benign laring yang biasa terjadi. Penyebab umum pada golongan dewasa ialah intubasi atau iritasi yang berpanjangan serta kecederaan pada pita suara. Dari segi pengurusan saluran pernafasan, VCG boleh menyebabkan kesulitan intubasi. Kami melaporkan satu kes berkenaan VCG semasa intubasi. Kajian ini melaporkan seorang bayi perempuan berusia 4 bulan, dengan diagnosis hernia diafragma berulang. Dia telah diintubasi kerana kemungkinan kolaps pernafasan yang akan berlaku sebelum pembedahan. Intubasi berjaya dilakukan dengan ukuran tiub endotrakeal (ETT) yang lebih kecil, iaitu 3Fr dengan stylet pada percubaan ketiga oleh intensif pediatrik. Laringoskop dilakukan selepas pembedahan. Hasilnya ialah granuloma terlihat di kedua-dua komisura posterior. Dalam kes ini, bayi tidak menunjukkan tanda atau gejala VCG. Walau, bagaimanapun, dia berisiko untuk mendapat VCG memandangkan sejarah intubasi untuk pembedahan pertama hernia diafragma dan kemungkinan refluks laringofaring akibat hernia tersebut. Kesulitan intubasi seharusnya dijangka pada pesakit tersebut memandangkan sejarah intubasi dan refluks laringofaring.*

*Kata kunci: Granuloma; pediatrik; pita suara*

### ABSTRACT

Vocal cord granuloma (VCG) is a benign laryngeal lesion. Common causes in adult are prolonged intubation or irritation as well as injury to vocal cord. In term of airway management, VCGs may lead to difficult intubation. We reported a case scenario of VCG during rapid sequence induction. A 4-month-old baby girl, with a diagnosis of recurrent diaphragmatic hernia. She was intubated for

**Address for correspondence and reprint requests:** Dr Winnie Wong Siaw Tin. Department of Otorhinolaryngology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Kuala Lumpur, Malaysia. Tel: +6016-5895125 Email: [winniewongsiawtin@gmail.com](mailto:winniewongsiawtin@gmail.com)

impending respiratory collapse prior to operation. Successful intubation with smaller endotracheal tube (ETT) size 3Fr with stylet at 3<sup>rd</sup> attempts by pediatric intensivist. Direct laryngoscope was done post operation. Finding was granuloma noted over the both posterior commissures. In the present case, the 4-month-old baby had no sign and symptom of vocal cord granuloma. However, she was at risk of develop VCG in view of the history of intubation for first operation of diaphragmatic hernia and possibility of laryngopharyngeal reflux due to the hernia. Difficult airway should be anticipated in this patient in view of the history of intubation and laryngopharyngeal reflux.

Keywords: Granuloma; pediatric; vocal cord

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## INTRODUCTION

Vocal cord granuloma (VCG) is a benign laryngeal lesion. Common causes in adults are prolonged intubation or irritation as well as injury to vocal cord. VCGs are rarely reported in children as few of them require prolonged intubation and increased awareness to use smaller endotracheal tubes and conservative endotracheal cuff pressures compared to adults (Shah et al. 2021). However, in this COVID-19 era, there will be increasing case of VCG in children as there is more child with prolonged intubation due to severe COVID infection. In terms of airway management, VCGs may result in difficult intubation. We reported a case scenario of VCG during rapid sequence induction.

## CASE REPORT

A 4-month-old baby girl, with a background history of repaired congenital right diaphragmatic hernia, was brought to the district hospital by her parent with the main concern of

rapid breathing. She had a cough and fever before the symptom.

She was diagnosed with acute bronchiolitis and admitted to the ward with an oxygen supplement. In the ward, air entry and bowel sound were noted upon lung auscultation over the right lung. Chest X-ray showed right thorax occupied by bowel loops. She had recurrent right diaphragmatic hernia. Subsequently, the child was transferred to a tertiary hospital for surgical intervention.

Upon arrival at the tertiary hospital, the child had worsening respiratory distress. She was cyanosed with deep chest recession. She required a high flow nasal cannula with flow of 2L/kg/min for respiratory support. Further examination and bedside ultrasound suggested worsening of the diaphragmatic hernia. Surgery was planned for the next day.

However, the child's condition deteriorated before surgery. She was intubated for impending respiratory collapse. Difficulty was encountered during intubation with endotracheal tube (ETT) size 4Fr by a senior medical

officer as the vocal cord was “tight”. Successful intubation with smaller ETT size 3Fr with stylet at 3<sup>rd</sup> attempts by the pediatric intensivist. Subsequently, child developed hypotensive episodes and required single inotrope support. The child was sent to the operation theatre for diaphragmatic hernia repair.

Because of the difficult intubation, the child was referred to Ear Nose Throat (ENT) team for airway assessment. A direct laryngoscope was done. The finding was granuloma noted over both posterior commissures (left>right), only involving posterior 1/3<sup>rd</sup> of vocal cord. Granuloma appears broad-based. Excision of the granuloma was done. The child was extubated 2 days after the operation and discharged well later on.

## DISCUSSION

VCGs also known as vocal fold granulomas, are non-cancerous mass grow on the vocal fold. The most common causes include endotracheal intubation, laryngopharyngeal reflux and idiopathic. VCGs are more common in adults than in pediatric age group (Martins et al. 2019).

In the present case, the 4-month-old baby had no sign and symptom of vocal cord granuloma. However, she was at risk of develop VCG in view of the history of intubation for first operation of diaphragmatic hernia and possibility of laryngopharyngeal reflux due to the hernia.

Intubation of the patient with VCGs can be difficult in view of the potential narrowing of the glottis and airway obstruction. A case regarding

intubation of laryngeal granuloma was reported in 2014. The granuloma was lodging in the subglottic area during intubation. Manipulation of ETT tube to reposition the granuloma to supraglottic area and surgical excision of the granuloma was done (Nakahira et al. 2014). In our case, this VCG caused difficult airway in patient and led to hypoxia and hypotension. During intubation, vocal cord was narrow and unable to fixed in ETT tube with size 4Fr. Smaller ETT tube was used for intubation.

There is no best treatment for VCGs. Pharmacological treatment includes corticosteroids, proton pump inhibitors, nonhormonal anti-inflammatory drugs, and botulinum toxin. This treatment is usually slow and requires changing habits and dietary discipline. Surgical treatment is fast, but needs general anesthesia which has higher complication rate.

## CONCLUSION

We reported a case of difficult airway intubation for a 4-month-old patient who had been diagnosed with vocal cord granuloma. The difficult airway should be anticipated in this patient in view of the history of intubation and laryngopharyngeal reflux.

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