

Anaesthetic management of subglottic stenosis complicated by pre-eclampsia in pregnancy

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Introduction:

Subglottic stenosis is a rare cause of upper airway obstruction, affecting approximately 1 in 400,000 people [1]. Potential causes of subglottic stenosis include iatrogenic damage following prolonged intubation, autoimmune diseases such as granulomatosis with polyangiitis and idiopathic stenosis. Presenting symptoms include dyspnoea, stridor, and wheeze.

The severity of subglottic stenosis is determined by the Myer-Cotton grading system based on the degree of luminal obstruction and this informs the potential management options including: conservative approaches, local steroid injection, antimetabolites, balloon dilatation, or surgery [1].

Subglottic stenosis presents significant anaesthetic challenges in pregnancy [2]. Airway oedema associated with pregnancy, particularly when compounded by pre-eclampsia (PET), may exacerbate symptoms and increase the risk of acute airway compromise [3]. We report the anaesthetic management of a parturient with symptomatic subglottic stenosis complicated by PET requiring expedited caesarean section.

Case Report:

A primiparous woman at 36 weeks’ gestation, with a background of asthma, was admitted following a community diagnosis of PET. During admission she developed progressive shortness of breath, having attended the emergency department multiple times during pregnancy with similar symptoms. At 34 weeks’ gestation, ear, nose and throat (ENT) review demonstrated approximately 50% subglottic stenosis.

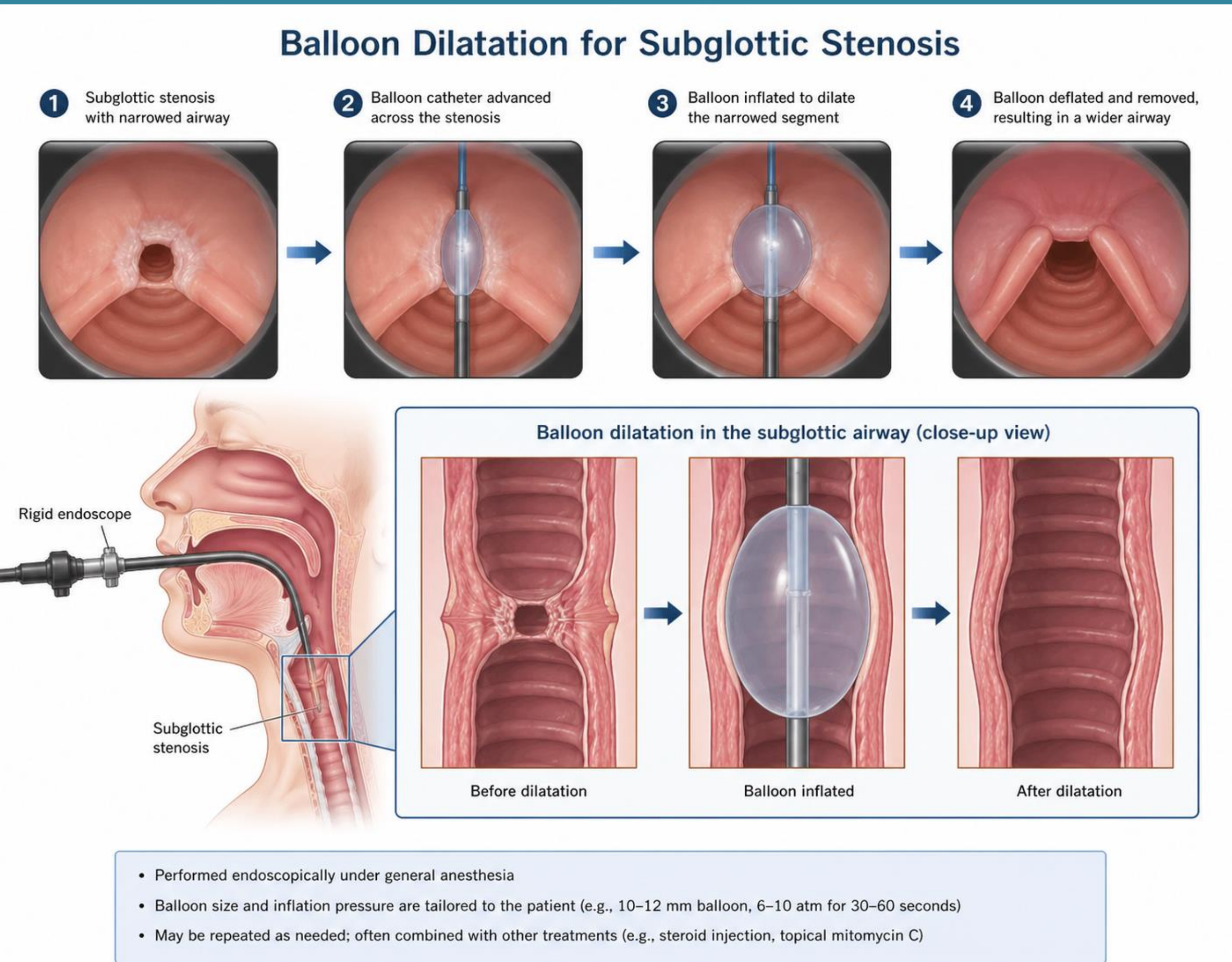
During her admission, her respiratory status deteriorated, with increasing dyspnoea and the development of audible stridor at rest, indicating critical airway narrowing. This prompted urgent ENT review, and medical management was commenced including nebulised steroids and salbutamol. Given the progression of symptoms in relation to her subglottic stenosis and the additional risk posed by PET-related airway oedema, there was significant concern regarding further airway compromise.

Multidisciplinary team discussions involving obstetric anaesthetists, obstetricians, and ENT surgeons led to the decision to proceed with an expedited caesarean section.

MEYER–COTTON GRADING SYSTEM
FOR SEVERITY OF SUBGLOTTIC STENOSIS

GRADE	DESCRIPTION	DEGREE OF OBSTRUCTION	ENDOSCOPIC APPEARANCE (Typical)
I	Mild stenosis Obstruction < 50% of the airway	0 – 50% obstruction	 Lumen reduction less than 50%
II	Moderate stenosis Obstruction 51–70% of the airway	51 – 70% obstruction	 Lumen reduction 51% to 70%
III	Severe stenosis Obstruction 71–99% of the airway	71 – 99% obstruction	 Lumen reduction 71% to 99%
IV	Complete stenosis No detectable lumen	100% obstruction	 No detectable lumen (100% obstruction)

Note: Grading is determined based on the percentage of airway lumen obstruction compared with the normal subglottic airway.



Case Report (continued):

Our approach was chosen to reduce ongoing physiological stress and minimise the risk of further airway deterioration. Neuraxial anaesthesia was selected as the preferred technique to avoid complications associated with airway instrumentation. Comprehensive contingency planning for emergency airway management was undertaken, including the availability of advanced airway equipment, the presence of ENT surgeons in theatre, and preparedness for front-of-neck access if required.

The caesarean section was completed successfully under neuraxial anaesthesia, with no intraoperative airway complications, and a healthy baby was delivered. In the immediate postoperative period, however, her stridor recurred, prompting admission to the intensive care unit for close monitoring. She required two days of high-flow oxygen therapy alongside supportive management, during which her respiratory status gradually stabilised. Following clinical improvement, she was discharged from intensive care and subsequently from hospital. She has since been reviewed by the ENT team and referred for balloon dilatation as definitive management of her subglottic stenosis.

Discussion:

This case highlights the anaesthetic challenges of managing subglottic stenosis in pregnancy, particularly when compounded by PET–related airway oedema. The presence of stridor in pregnancy should prompt urgent evaluation, as it may indicate critical airway compromise.

Neuraxial anaesthesia enabled safe caesarean delivery despite ongoing stridor, avoiding airway instrumentation in a high-risk patient. However, this strategy requires careful patient selection and robust contingency planning. The risk of conversion to general anaesthesia must always be anticipated, with a clearly defined plan for difficult airway management, including early involvement of ENT surgeons.

Although antenatal balloon dilatation under total intravenous anaesthesia with apnoeic oxygenation has been described at earlier gestations, this was not appropriate in this case due to the timing of presentation, severity of symptoms, and presence of PET [2]. Irrespective of the anaesthetic technique employed, early recognition, meticulous multidisciplinary planning and clearly defined emergency airway strategies are essential to optimise both maternal and fetal outcomes.

References:

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3. Dornan L, Crawford M, Milligan P, Ward PA. Subglottic stenosis in pregnancy: a case report. J Oral Maxillofac Anesth. 2025;4:9