

How I do it:

Emergency management of tracheo-brachiocephalic artery fistula

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Abstract

The authors present a technique for emergency management of a tracheo-brachiocephalic artery fistula.

Key words: Tracheostomy, Brachiocephalic Trunk; Fistula

Introduction

Tracheo-brachiocephalic artery fistula is a rare and usually fatal complication of tracheostomy. Erosion of the tracheal wall leading to subsequent pressure necrosis of the wall of the brachiocephalic artery can lead to ulceration of the artery. Combined with the presence of infection the risk of breach into the arterial lumen is high. Even in a tracheostomy performed through the second and third tracheal rings the anatomical relationship of the tube cuff or tip relative to the brachiocephalic artery is very close.¹ (Figure 1) The haemorrhage associated with this complication is sudden and massive with a mortality approaching 100 per cent. In the few cases that have survived the initial haemorrhage, definitive treatment options include division of the brachiocephalic artery with separation of the divided ends from the trachea with viable tissue or repair of the

fistula with autologous pericardium.² The authors present a method for emergency management of the haemorrhage prior to definitive surgical treatment.

Method

As an initial measure if the patient has a cuffed tracheostomy tube *in-situ* this is immediately inflated. The patient is then intubated and an endotracheal tube is placed above the tracheostomy tube. The tracheostomy cuff is partially deflated allowing withdrawal of the tracheostomy tube to the anterior tracheal space. This manoeuvre allows the advancement of the endotracheal

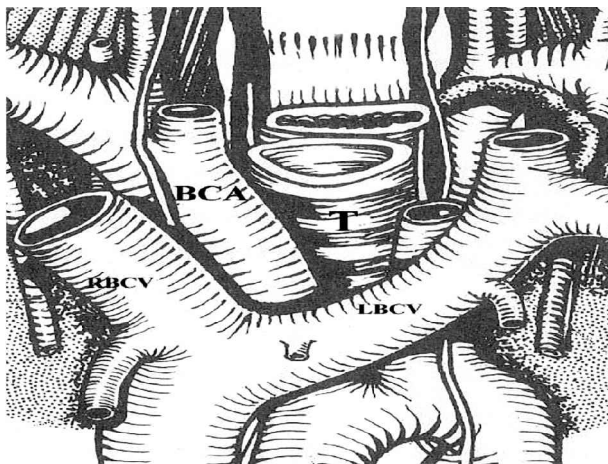


FIG. 1

Relation of brachiocephalic artery to trachea. BCA = Brachiocephalic artery; LBCV = Left brachiocephalic vein, RBCV = Right brachiocephalic vein; T = Trachea.

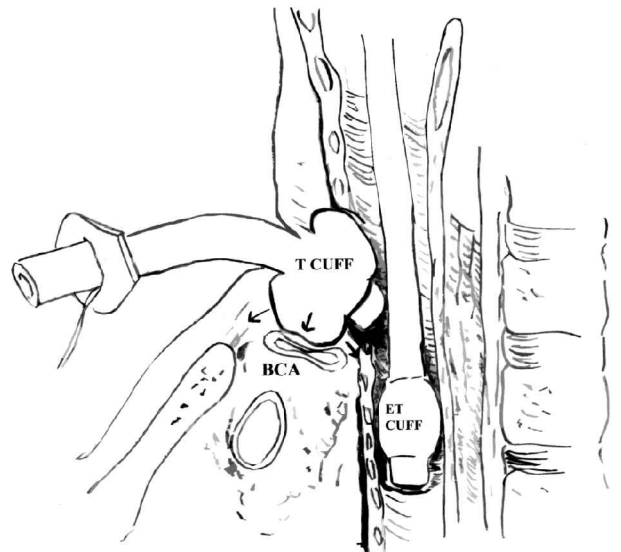


FIG. 2

Sagittal section – T CUFF tracheostomy tube cuff inflated in anterior tracheal space, achieving pressure tamponade of the brachiocephalic artery (BCA). ET CUFF endotracheal tube with cuff inflated in trachea distal to fistula.

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Accepted for publication: 24 September 2003.

tube to a position in the trachea distal to any bleeding in order to maintain an airway. Simultaneously the tracheostomy tube cuff is inflated maximally in the anterior tracheal space exerting suprasternal pressure producing tamponade of the brachiocephalic artery in the pretracheal space (Figure 2). In this way bleeding can be temporarily controlled in preparation for a more definitive procedure to repair the tracheo-brachiocephalic artery fistula.

This method relates to the management of a 32-year-old man presenting to the intensive care unit with diarrhoea, vomiting, septicaemia, hypoxia and suspected neuroleptic malignant syndrome. Acute respiratory distress syndrome soon followed and a standard percutaneous tracheostomy was performed six days following admission to the intensive care unit. A size 8 cuffed Shiley tube was placed with no immediate complications. Bleeding from the tracheostomy wound was noted nine days following the tracheostomy. Rapid blood loss soon followed and the presumptive diagnosis of a tracheo-brachiocephalic artery fistula was made. This method describes the emergency management of the tracheo-brachiocephalic artery fistula by a pressure tamponade technique. The definitive treatment involved the application of a pericardial patch to the brachiocephalic artery. The patients' subsequent

recovery has been slow with a gradual improvement in conscious level over the six weeks following emergency surgery.

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Mr R. Anthony takes responsibility for the integrity of the content of the paper.
Competing interests: None declared
