

Percutaneous Dilatational Tracheostomy: An Alternative & Secure Way to Protect Airway in Patients with Space Infection : A Case Report

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Abstract

Management of patient with space infection is always a challenging job, as in most of the cases there is always an impending risk of airway obstruction. Incision and drainage (I/D) under general anaesthesia via oral or nasal intubation carries a risk of aspiration of pus, so tracheostomy becomes the treatment of choice. In this case report we discussed the management of submandibular and buccal space infection under general anaesthesia via Percutaneous dilatational tracheostomy.

Keywords: Space infection, Percutaneous dilatational tracheostomy, Incision and drainage, bronchoscopy.

Introduction

Tracheostomy, as a means of airway access, is one of the oldest surgical procedures documented, dating back approximately 4000 years. However, it wasn't until the early 20th century, when Chevalier Jackson introduced clear guidelines, stating that "tracheostomy deemed a safe and viable procedure". Although, variations of the standard open tracheostomy have evolved over the last half century, but with advances in technology and increasing interest in minimally invasive procedures, percutaneous tracheostomy is the latest modality to secure airway in compromised patients.

Since, Ciaglia et al introduced the percutaneous dilatational tracheostomy (PDT) in 1985, it has become increasingly popular and has gained widespread acceptance in many ICU and trauma centers as a viable and safer alternative approach to conventional procedures.¹

In some institutions, PDT has become the procedure of choice. The most popular technique today is the percutaneous dilatational tracheostomy described by Ciaglia in 1985.² This technique uses serial dilators over a guide wire and is usually

done at the bedside in the intensive care unit under bronchoscopic guidance. Ciaglia later introduced a single tapered dilator to replace the serial dilators, further simplifying the technique.

Case report

A male aged 70yrs resident of Meerut, came as an OPD patient in Anand Multispecialty Hospital, Meerut with a chief complaint of swelling on right side of face and pain on mouth opening since 1 week.

On enquiring the history of present illness, it was found that patient had swelling initially on right submandibular region which slowly extended within a day to right buccal space. Patient had pain on mouth opening and also had difficulty in swallowing for which he went to local dentist, who examined him and found grossly carious 46, 47 and 48, and advised him Incision and drainage (I/D) under antibiotic coverage. Patient came for second opinion and on inspection; swelling was prominent and diffuse on right lower half of the face extending from right tragus up to anteriorly till right angle of the mouth, superiorly extending from a line drawn from right trago-alar line up to inferiorly till right inferior border of the mandible. On palpation, swelling was tender, tensed and non fluctuant, when further enquired about the medical history; it was found that patient is diabetic and did not have anything substantial for past 3 days. Patient referred for general medical examination and advised him blood sugar investigation, which showed poor diabetic control (436mg/dl). They admitted the patient and administered insulin infusion and opined that patient can be taken for I/D after reasonable sugar control. After anaesthetic clearance we planned I/D under GA via Percutaneous dilatational tracheostomy as there is always an eminent risk of pus aspiration with conventional intubation technique.

Procedure

Patient random blood sugar was repeated and after achieving reasonable control over blood sugar (254mg/dl), patient was taken for I/d under General anaesthesia via Percutaneous tracheostomy, after taking a high risk consent. Percutaneous tracheostomy was performed via Ciaglia technique. A horizontal incision was made at the anticipated point of entry with a scalpel blade and blunt dissection with forceps was carried out which allows palpation of the cricoid and the upper tracheal rings (Fig.1). After this, a needle and cannula assembly was carefully introduced in the midline between 2nd and 3rd tracheal rings, the needle was then slowly advanced with continuous aspiration until the position of the needle tip in the trachea was confirmed by aspiration of air. Now a J-tipped flexible guidewire is threaded through the cannula into the trachea (Fig.2). Next, a small, firm dilator was slid over the wire through the soft tissues into the trachea (Fig.3). After the wire is in place, the dilator is removed and free movement of the wire is checked. The dilating forceps were advanced with the tip at the same angle of approach to the trachea as the wire to fashion the stoma. The handle of the forceps was lifted to the vertical position and was opened to tear the trachea between the rings. The forceps were now withdrawn in the open position and tracheostomy tube was slid over the wire into the trachea (Fig.4). The guide wire and obturator were then removed, leaving the tracheostomy tube in place. The tube was then aspirated to remove blood and secretions. After the ventilation was made patent, patient preparation was done and stab incision given with 15 no. blade in the right submandibular region in 2 locations (one at angle region and other at the body region) at 2finger breadth distance from the inferior border of the mandible. Next, curved artery forcep was inserted into the submandibular

space and blunt dissection carried out and pus was drained. Buccal space was drained via the same incision and drainage made patent by inserting the corrugated drain (Fig.7). After this, Ferguson mouth gag applied and inter incisal mouth opening was increased to 25mm from 10mm, and then culprit teeth(46,47 and 48) were removed. Drained pus specimen was collected and sent for culture and specificity.

Discussion

Tracheostomy is a better alternative to oral or nasal intubation because it is well tolerated and eases pulmonary toileting as well. Modifications of tracheostomy technique has lead to introduction of Percutaneous tracheostomy in 1955 that did not gain much popularity because of associated fatalities.³ Ciaglia and colleagues in 1985 reintroduced the technique as Percutaneous dilatational tracheostomy.¹ Since then it has almost replaced the conventional tracheostomy in critical care

setup. Percutaneous tracheostomy has already replaced the surgical route in several intensive care units and it is indeed the procedure of choice in the majority of cases. This is attributable to the fact that, in experienced hands, it is safe, easy and quick, and there is no need to move the patient to the operating room. Perioperative complications are at least comparable with those of surgical tracheostomy and most of them are minor. With proper patient selection, operator experience and attention to detail complication rates can be reduced that may have an influence on late complications. An important advantage of PDT over the surgical route is the very low rate of stomal infection.⁴ Several reports have also shown that PDT is cheaper than ST, which is of course important at a time when resources are limited. Despite all the virtues of the percutaneous technique, the role of ST in cases with contraindications for PDT, difficult anatomies and failed PTs

remains unchallenged. The decision on which method to use should solely be made depending on the clinical situation and the experience of the operator. The fact that a technique is declared 'easy' should not lead to an attitude that every clinician may get a chance to try it. PDT must be left in the hands of clinicians with enough experience, although at the moment there are no criteria to define this quality.

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