

TECHNICAL NOTE

Excision of tracheocutaneous fistula under local anaesthesia

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Keywords

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Abstract Tracheocutaneous fistula (TCF) is a known complication of tracheostomy. It can cause problems such as saliva leak, predispose to infection from external skin into respiratory tract and cosmetically not acceptable. Treatment of the underlying infection is paramount important. Persistence of tract after sufficient duration of observation period should be surgically treated. Cases reported in the literature are mainly regarding paediatric TCF and the procedures are usually done under general anaesthesia. We describe a case of surgical treatment of an adult TCF which was done under local anaesthesia.

Case Summary

A 24-year old Malay lady was diagnosed to have Non-Hodgkin Lymphoma after she presented with multiple neck swellings and mediastinal mass. She had developed upper airway obstruction in which a tracheostomy was indicated and performed. She was on tracheostomy tube during the period of chemotherapy treatment under Hematology Unit care, for 2 years without any significant problem.

As the treatment commenced, she showed good improvement. The neck swelling reduced in size. Tracheostomy tube decannulation was planned and successfully done. After 2 years of decannulation, the tracheostoma still persisted. She complained of saliva leak and she could feel the expired air especially during coughing. Examination confirmed the presence of fistula (Figure 1). The skin opening measured 0.5 x 0.5 cm. There was an air leak during cough.

Surgery was planned. Excision of the tract with primary closure was proposed to be done under general anaesthesia but the patient preferred to be done under local. Local anaesthesia (marcaine in adrenaline 1:80000) was infiltrated at the planned incision site. Injection of the local anaesthesia was also done to the deeper structures perpendicular to the fistula opening. The elliptical incision was made including the fistula opening and the previous tracheostomy scar. The tract was traced until

the trachea was identified. A slit opening on the anterior tracheal wall was noted. The fistula, from its attachment on the tracheal wall to the opening on the skin was removed in total.

Closure of the wound was made with absorbable 3/0 suture subcutaneously after obliteration of the potential space was done with the similar suture. Skin incision was closed with non-absorbable 4/0 suture. The patient tolerated the whole procedure well without any pain or discomfort.



Figure 1: Tracheocutaneous fistula which persisted after 2 years decannulation.

The patient was observed closely in the ward overnight for any complication that might arise. On the next day, the patient was discharged. During follow-up visit, the wound was noted to heal well. No wound gaping or inflammatory changes seen at the adjacent area. After two months, the wound was found to be completely healed without any defect.

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Discussion

Tracheocutaneous fistula (TCF) is not uncommon complication of tracheostomy. Although it is not a life-threatening event, the presence may predispose a patient to be susceptible to respiratory tract infection, skin ulceration due to chronic irritation from secretions, dysphagia and cosmetically unacceptable.

The stoma of a tracheostomy usually heals spontaneously. One of the factors that contributed to the persistence of the stoma is the duration of cannulation. Kulber and Passy (1972) reported that cannulation longer than 16 weeks resulted in a 70% occurrence of TCF while those cannulated less than 16 weeks closed spontaneously. The other predisposing factor reported was the 'starplasty' technique used in tracheostomy in children (Sautter *et al.*, 2006). The 'starplasty' tracheostomy, introduced in 1990, is an alternative paediatric tracheostomy technique in which a TCF is intentionally created by constructing a continuous circumferential mucocutaneous suture line between the cervical skin and tracheal mucosa (Koltai, 1998).

Surgical treatment of the fistula involves excision of the epithelialized tract, and closure of the wound. It is important to ensure that the whole fistula tract was completely excised as the remnant of the epithelialized tract will lead to recurrence or persistence of fistula. To achieve this aim, the opening of the fistula in the skin should be removed. Then, the fistula tract should be traced from superficial to deep preserving its continuity as intact as possible. The procedure can be more challenging if there is presence of excessive scar formation from the previous tracheostomy surgery.

Unlike performing tracheostomy, excision of TCF usually less traumatic. It is because the main bleeding source during tracheostomy or any anterior neck surgery, which is anterior jugular vein is already ligated. The anterior jugular vein is ligated as it is situated below the platysma and above the strap muscles. Thus, ligation of the vessel is needed before raising the subplatysmal flap.

After the fistula was completely excised, the wound need to meticulously closed as any potential space left will predispose to accumulation of blood clot and infection sets in. The neglected potential space also can lead to persistent air leak from the anterior tracheal wall and subsequently the fistula will be re-established.

There are many techniques described to achieve this good closure of the wound. A retrospective review of 13 patients who underwent cauterization of TCF showed that the technique was simple, effective and safe (Eaton *et al.*, 2003). Only one patient noted to have leak. Wound closure also can be done with primary closure with or without using flap. In our case, it was closed with primary closure technique. Sautter *et al.* (2006) reviewed 13

cases of TCF. All closure performed as a fistulectomy with primary closure in three layers. Drains were not used in any of the patients. Fisher (1991) reports success with perichondrial flap interposition and drainage in persistent high fistula. Larger fistula may need a hinge flap and a V-Y advancement flap (Lee *et al.*, 2002).

General anaesthesia was always being used in the surgery of TCF most probably because the patients were from paediatric age group, to assist closure of large fistula that require flap, and some surgeons do perform endoscopic examination of inner tracheal lumen during the surgery. This has made general anaesthesia superior to the local procedure.

There are several complications of fistula closure. One of the life-threatening events is subcutaneous emphysema and pneumothorax which may lead to airway compromise. Mohan *et al.* (2003) reported a 9-year-old male child posted for closure of TCF developed extensive subcutaneous emphysema resulting in acute respiratory distress immediately after transfer to recovery room. In view of the possibility of airway compromise following closure, some authors recommended recannulation followed by healing by secondary intention especially in patients with large fistula. A large fistula is defined as a defect of the anterior tracheal wall of 4 mm or more in diameter. The fistulas are excised, tracheostomy tube reinserted and observation for healing by secondary intention after a short cannulation period (Drezner and Cantrell, 1998).

Conclusion

Treatment of persistent TCF is safe and simple. Many techniques have been advocated based on surgeon experience, patient age and the nature of the fistula itself. Paediatric patient, procedures combined with endoscopic examination of the inner tracheal mucosa, wound closure requiring flaps and patient comorbidities may require general anaesthesia. Our case highlight the procedure in an adult TCF performed successfully under local anaesthesia with good outcome.

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