The provision of surgical tracheostomies by maxillofacial surgeons in the UK: time for a dedicated tracheostomy team?

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ABSTRACT

Surgical tracheostomy is a commonly provided service by surgical teams for patients in intensive care where percutaneous dilatational tracheostomy is contraindicated. A number of factors may interfere with its provision on shared emergency operating lists, potentially prolonging the stay in intensive care. We undertook a two-part project to examine the factors that might delay provision of surgical tracheostomy in the intensive care unit. The first part was a prospective audit of practice within the University Hospital Coventry. This was followed by a telephone survey of oral and maxillofacial surgery units throughout the UK.

In the intensive care unit at University Hospital Coventry, of 39 referrals, 21 (53.8%) were delayed beyond 24 hours. There was a mean (standard deviation) time to delay of 2.2 days (0.9 days) and the most common cause of delay was surgeon decision, accounting for 13 (61.9%) delays. From a telephone survey of 140 units nationwide, 40 (28.4%) were regularly involved in the provision of surgical tracheostomies for intensive care and 17 (42.5%) experienced delays beyond 24 hours, owing to a combination of theatre availability (76.5%) and surgeon availability (47.1%). There is case for having a dedicated tracheostomy team and provisional theatre slot to optimise patient outcomes and reduce delays. We aim to implement such a move within our unit and audit the outcomes prospectively following this change.

KEYWORDS

Tracheostomy

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Introduction

The provision of a surgical or open tracheostomy is a common request from intensive care staff at hospitals around the country. Surgical specialties commonly tasked with the provision of surgical tracheostomies are otorhinolaryngology or ear, nose and throat, and oral and maxillofacial surgery. While the primacy of the surgical tracheostomy has been challenged in recent years by intensivists adept at performing percutaneous dilatational tracheostomy, there is still a place for the surgical tracheostomy in situations where this procedure may be hazardous, which may include patients with coagulopathies, unstable cervical spine injuries and unfavourable anatomy (e.g. the 'short' neck, obesity, the presence of a goitre or thyroid tumour and previous surgery in the neck).^{1–4}

Like many surgical specialties in the UK, we are constrained by the limitations of shared operating lists for emergencies. We were keen to assess what impact this had on provision of surgical tracheostomies and whether there was

scope for the introduction of a dedicated tracheostomy theatre slot.

Materials and Methods

This was a two-part project. The first part was a prospective service evaluation of surgical tracheostomies at a single unit (University Hospital Coventry) over a six-month period between June and November 2016. Variables recorded were the time from intubation in intensive care to referral and the delay from the point of referral to provision of surgical tracheostomy by the surgical team. Reasons for delay were recorded along with an explanation of the reasons given.

The second part of the project was a telephone survey of on-call surgeons at oral and maxillofacial surgery units nationally listed by the British Association of Oral and Maxillofacial Surgeons. Respondents were asked whether they were routinely involved in the provision of surgical tracheostomies for patients in intensive care. If so, they were asked whether these procedures were performed on an elective or

emergency list and whether they experienced delay in the provision of these (always, sometimes, rarely or never). Finally, they were asked what, in their opinion, were the reasons for such delays predominantly (where applicable).

Results

During the audit period at University Hospital Coventry, a total of 39 referrals were received, with 26 (67%) of these going to the oral and maxillofacial surgery team. Patients referred were intubated for a mean of 7.3 days (standard deviation, SD, 4 days) prior to the point of referral by the intensive care team for consideration of surgical tracheostomy (range 0–17 days).

Following referral, 21 (53.8%) cases were delayed beyond 24 hours, with surgical tracheostomies being performed at a mean delay of 2.2 days (SD 0.9 days; range 0–4 days). The most common causes for delay were surgical factors (Fig 1) accounting for 13 (61.9%) delays. Reasons given by surgeons for delaying tracheostomies included an unwillingness to perform these outside of elective lists, unavailability of senior surgeon cover for middle grades, an unwillingness to perform cases over the weekend and clashes with planned clinical commitments.

The national telephone survey contacted 141 units around the UK, yielding 140 (99.3%) responses. From this, 40 (28.4%) were regularly involved in the provision of surgical tracheostomies for intensive care. Teams performed surgical tracheostomies in the emergency theatre exclusively in 24 (60.0%) units, with a further 11 (27.5%) units providing tracheostomies in the emergency theatre predominantly, using the elective theatre when available (Fig 2). From those units where oral and maxillofacial surgical teams provided surgical tracheostomies, 17 (42.5%) experienced some form of delay beyond 24 hours in providing tracheostomies for patients in intensive care (Fig 3). Reasons cited for delay were theatre availability by 13 (76.5%) units and surgeon availability by 8 (47.1%) units.

Discussion

Surgical tracheostomies have the advantage over percutaneous dilatational tracheostomy of being placed in controlled

Figure 1 Reasons for delay to surgical tracheostomy provision at University Hospital Coventry.

Figure 2 Operating lists used for provision of intensive care unit-requested surgical tracheostomies.

Figure 3 Frequency of delay beyond 24 hours experienced by oral and maxillofacial surgery teams nationally in the provision of intensive care unit-requested surgical tracheostomies.

conditions under direct vision with reportedly lower incidence of technical difficulties, although Putensen and colleagues have shown no difference in outcomes for complications such as major intra-procedural bleeding and subcutaneous emphysema.^{5,6} Others have highlighted lower rates in infection with percutaneous dilatational tracheostomy, possibly as a result of the minimally invasive nature of the procedure.^{6–8} Surgical tracheostomies require theatre space, a theatre team and a surgical team, and are arguably less time effective, less resource effective and less cost effective.⁹ A number of factors may result in surgical tracheostomies being delayed such as surgeon availability, theatre availability and patient factors. In particular, the perceived importance and urgency of such patients on a shared emergency operating list may be low, as they are seen to be ‘stable’ patients in a safe environment on the intensive care unit.

The referral rate at our own hospital during the audit period was 6.5 cases/month. With the average cost of an intensive care bed being calculated at £1,551–1,647 in 1996–2006, coupled with a predicted rise in demand for critical care bed days of 4%,¹⁰ there is a growing need to facilitate early discharge from the unit. Given the frequency of

referrals, there is arguably a case for a dedicated daily theatre slot and team for the provision of surgical tracheostomies, with the facility for this slot to be 'absorbed' into the main emergency list should it not be required.

In the field of oral and maxillofacial surgery, the impact of shared emergency lists has been highlighted more widely, with El-Maaytah *et al.*¹¹ finding that nearly 65% of respondents to a national survey had no dedicated trauma list. Kalantzis *et al.*¹² demonstrated that, in their own experience, emergency operating had doubled over a five-year period and delays of more than 24 hours affected 29% of patients booked on to a shared emergency list. The benefits of dedicated operating lists with a familiar team are obvious and have been highlighted in orthopaedic surgery and plastic surgery, in particular, where dedicated lists result in faster access to surgery, improved patient outcomes and reduced length of inpatient stay.^{13,14} Indeed, the provision of dedicated trauma lists has long been recommended by the British Orthopaedic Association, a trend identified as reducing delays where it matters most.¹⁵

Our aim currently is to introduce a dedicated daily theatre slot within our unit with nominated team members. The service would be consultant led by a dedicated group of surgeons from the head and neck directorate who would form part of a rota system standing apart from the main on-call rota. The purposes of this rota would be to only serve the dedicated tracheostomy slot. Trainees would, of course, be able to provide tracheostomies under consultant supervision during these slots, to maximise training opportunities while still delivering a safe and effective service.

The slot would be on the emergency list as the first available slot in the morning. It is our experience that emergency cases often require some preparation following the morning emergency team meeting, as well as often coming from wards some distance from the operating theatre and it is feasible to use this time for a dedicated tracheostomy slot. Intensive care patients have the advantage of being in close proximity to the theatre complex, arriving intubated, ventilated and sedated. Surgical time from a dedicated tracheostomy team with Consultant-led care will be minimised and should not impact on the overall running of the emergency theatre. Should the slot not be used, this can easily be absorbed by the first available emergency case. We do not anticipate that elective services would be impacted upon. Using the first available slot on the emergency list has the added advantage that this would be a regular and fixed time point allowing intensive care staff the time to adequately prepare a patient for surgery. Many of these patients require feed to be stopped and sometimes platelet infusions prior to surgery, which can lead to delays on an emergency theatre list as intensive care staff are often unable to be given adequate notice to prepare a patient when the procedure cannot be planned for a fixed time. It is envisaged that senior intensive care staff would identify patients who require tracheostomy the following day in the preceding evening ward round. The patient can then be booked with the theatre

team and prepared well in advance of the first theatre slot, both anaesthetist and surgeon who would be assigned to the procedure would be forewarned well in advance, thus allowing for efficient management of the case with no delay.

No business case would be required to adopt the approach as outlined above. Currently, these patients are slotted into the emergency list when time allows and this is not additional work. It is planned that the availability of consultants will fit with their existing on call or clinical commitments on a rota basis; thus, no additional sessional requirements will need to be funded. There are already staff assigned to run the emergency list and no additional funding is required for the above plan, it is simply a more efficient use of the service and its existing staffing arrangements.

Following this audit, a mandate was granted to form a tracheostomy working group within the trust, with representatives from anaesthetics, intensive care and head and neck surgery. The group will look at a wide range of issues for patients with tracheostomy and laryngectomy and develop and design pathways for care (including arrangements for tracheostomies in intensive care) as well as learning packages for junior doctors and nurses and the resuscitation team. Many trusts and institutions already have tracheostomy multidisciplinary teams to better coordinate care. Such working groups are not new but the concept of a dedicated theatre slot and on-call rota is a novel concept that would aim to make the service more cost effective and more importantly improve patient care. We aim to implement this service and reaudit delays in the provision of surgical tracheostomies to see whether improvements can be made that might be translated nationally.

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