

Introduction

Management of the difficult airway (DA) has evolved to include a strategy for safer approach to both tracheal intubation and extubation¹⁻³ Head and neck (H&N) reconstruction frequently requires DA management and the risks of re-intubation for post-operative complications are increased in this population⁴. Given the increased potential for mortality and morbidity related to the loss of airway⁴, we advocate a proactive strategy is required for extubation of these cases Airway exchange catheters (AEC) for at risk extubations are recommended by experts to remain in situ for 30-60 min or until the airway is deemed safe⁵. This is counter to advice from the manufacture of the Cook AEC (Cook Medical, Bloomington, IN, USA) who do not recommend its use beyond immediate exchange of endotracheal tubes (ETT). Despite being reported as well tolerated by patients case reports highlight the potential damage caused by the device⁷⁻⁹ The Cook Staged Extubation Set (SES) (Cook Medical, Bloomington, IN, USA) is designed specifically to remain in situ facilitating access if reintubation is needed. Little has been published to support this novel device in the clinical setting¹⁰ In our department standard practice involves patients being extubated at the end of surgery and admitted to the high dependency unit for initial postoperative management. We have been using SES for H&N reconstructive surgery as an extubation strategy since 2014. We place the wire at the time of extubation aiming to remove it after the airway is deemed safe This audit was designed to look at length of time wire is situated, time to removal and complications related to its use.

Methods

We conducted a retrospective audit of notes including all intra-oral free flap reconstruction for H&N cases performed at Norfolk and Norwich University Hospitals from September 2014 to March 2015 Data collected included: age, gender, surgical procedure, depth of insertion of the set, length of time wire remained in situ, reintubation rate, team deciding on removal and complications related to the set. Descriptive data calculated with Microsoft® Excel® 2011 for Mac®



Picture 1. Position of wire

Results

37 sets of notes of patients who underwent H&N Reconstructive Surgery with free flap and nasal intubation were reviewed Average age and gender as well as type of surgery are described in Table1. SES was used in 17 patients out of 37. 3 patients required reintubation. SES was used in all 3 cases where the wire was in situ for an average time of 2hrs. There were no complications reported during reintubation Of those pulled out within 1hr, two were due to agitation on awakening, one was accidentally removed at extubation and in one case the anaesthetist removed the wire due to excessive coughing

Table1. Demographics

Age (years)	65 ±12,87
Gender	Male 57,9% Female 42,1%
Type of surgery	Tongue 52, 6% Mandibula 36,4% Floor of mouth 11%

Figure 1. Time wire remained inserted

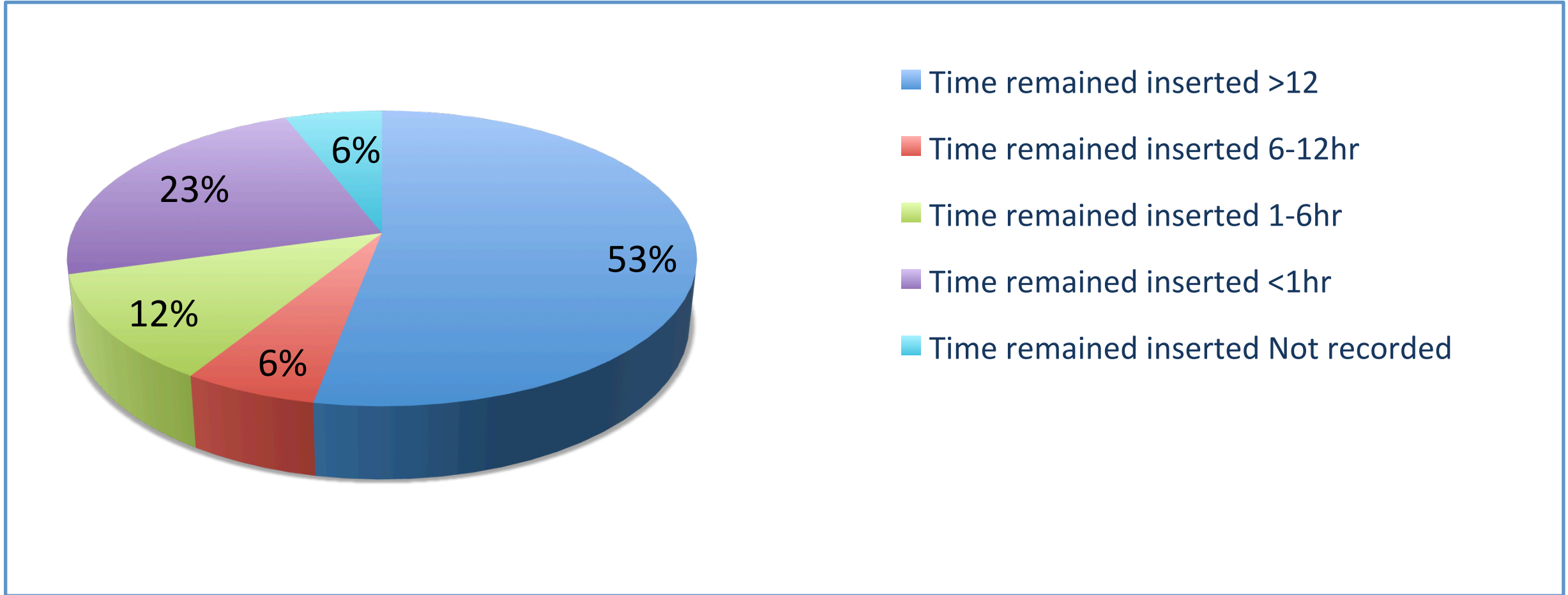


Figure 2. Team deciding on removal

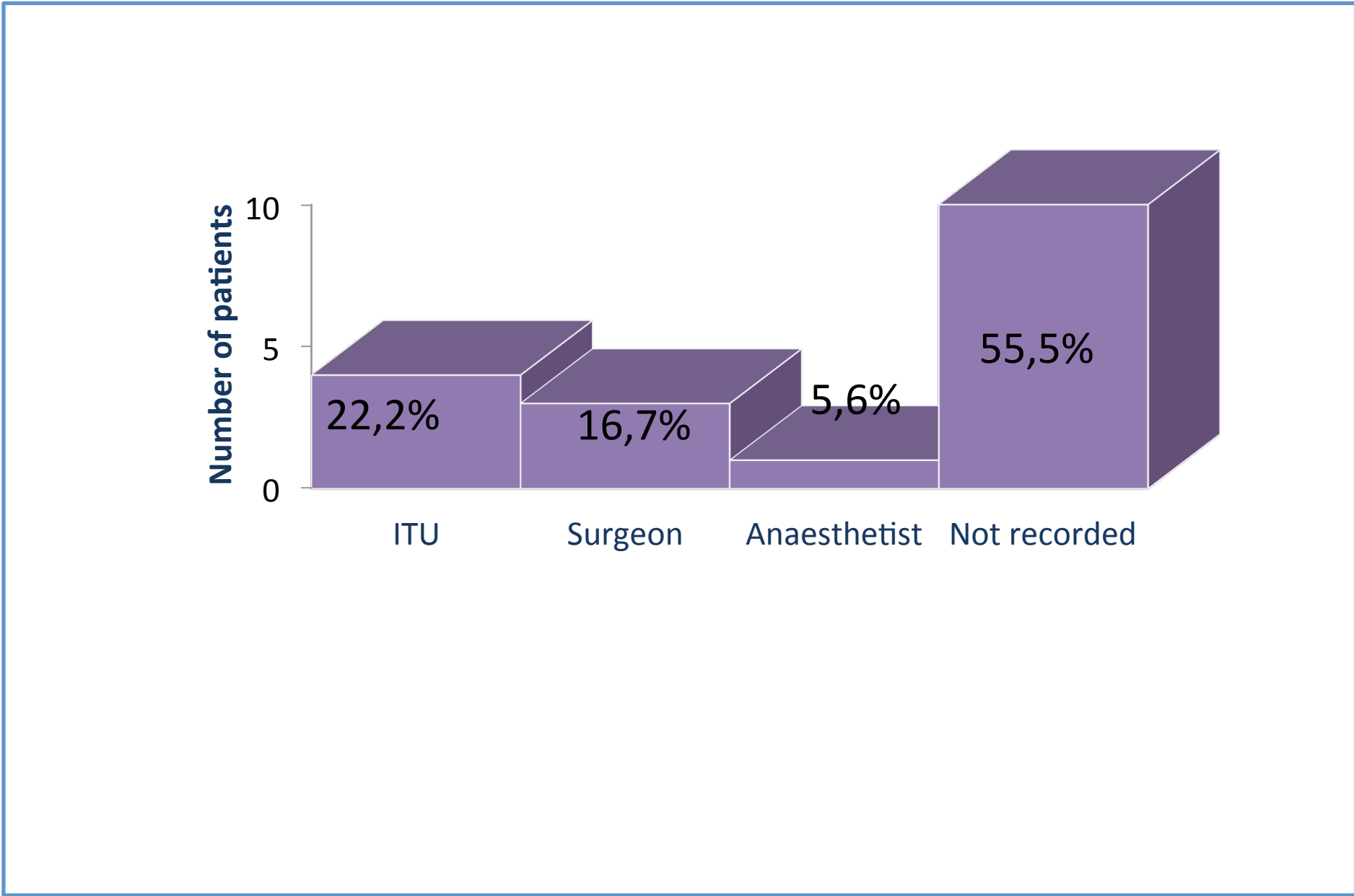
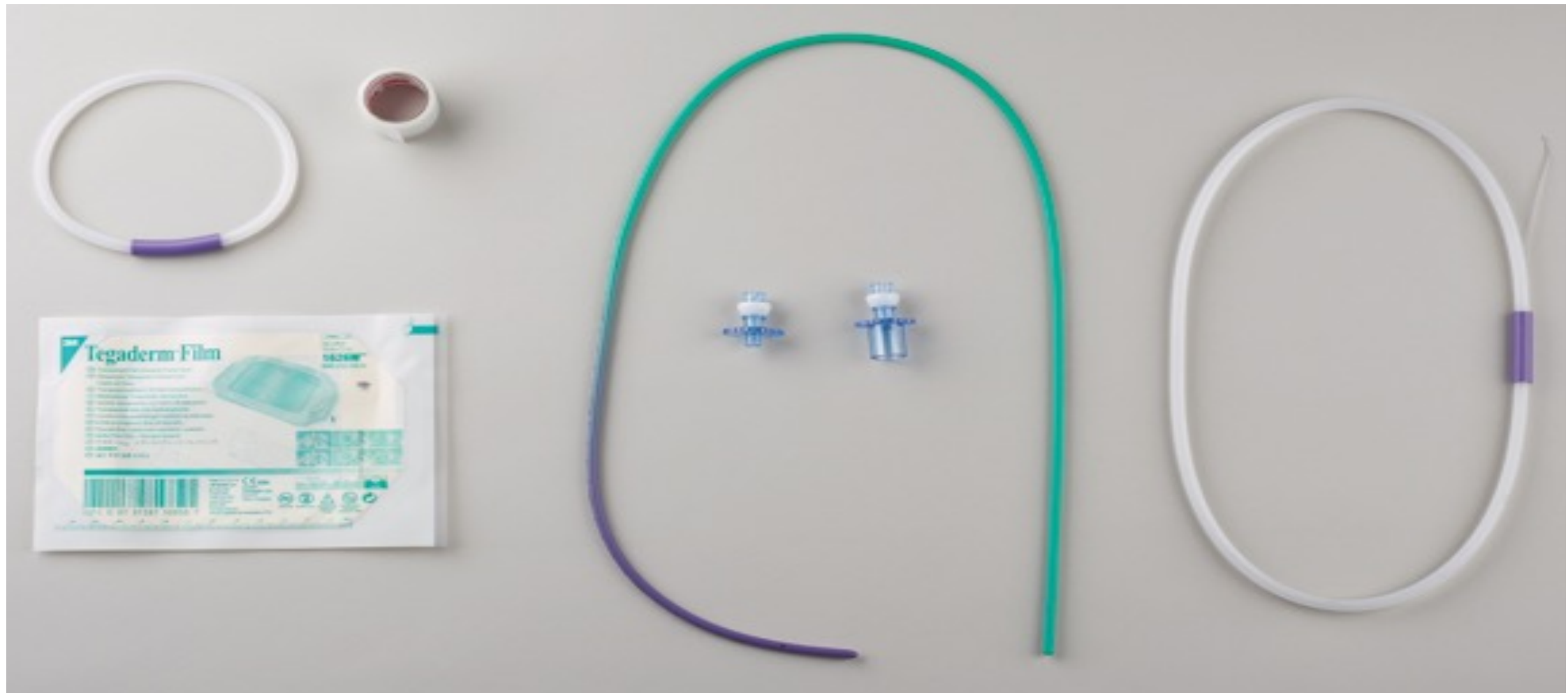
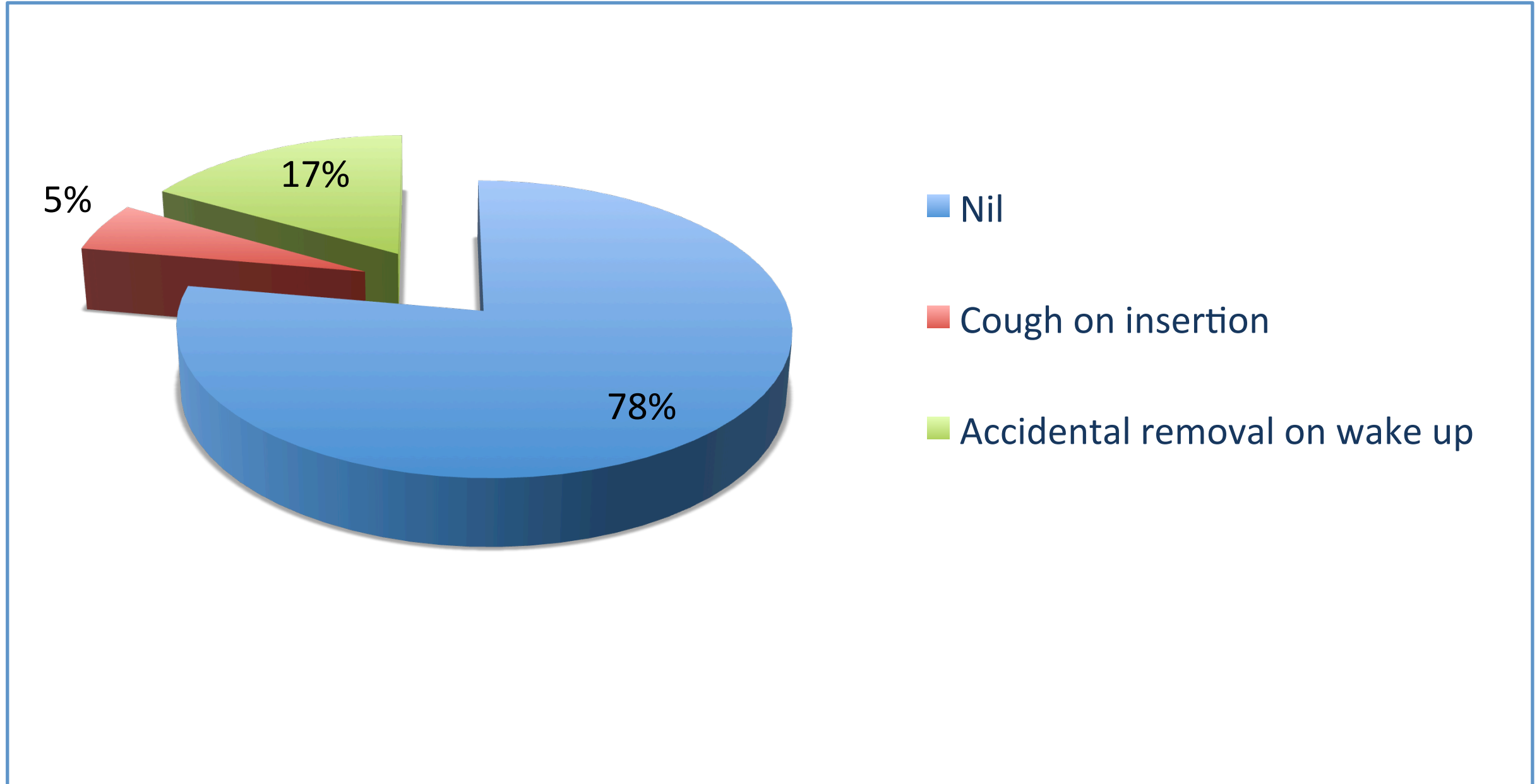


Figure 3. SES related complications



Picture 2. Staged Extubation Set

Discussion

The Cook SES is formed by a coated wire with soft distal tip, 145cm length, a 14F soft tipped and hollow catheter 83cm length and a rapifit connector as well as all requirements for fixation (tape, device for coiling wire and dressing) Both the Difficult Airway Society and the ASA Task Force on Management of the DA agree that to extubate a difficult airway a plan should be in place and they both advocate for the use of devices that can serve as a guide for expedited reintubation¹⁻³ Extubation failure and need for reintubation is rare for elective surgery (0.1-0.45%) and can occur up to 72hr post operative, most commonly in the first 6 hr. Reconstructive H&N surgery has been identified as a risk factor for failure^{4,5} with a reintubation rate 0.7-11.1%. It was also accounted for approximately 40% of all cases reported to NAP⁴ Improving strategies for emergence of anaesthesia in cases involving DA have been advocated to improve patient safety⁶. As part of this approach, we believe that maintaining access to the airway is key to decrease morbidity and mortality in case reintubation is needed. These patients are particularly at risk of complications due to distorted anatomy caused by airway oedema and bleeding which can complicate reintubation Our results suggest that the SES helps to maintain access to a potential difficult airway for up to 12hr post-extubation Severe complications associated with the use of AEC such as airway damage or perforation have been reported⁷⁻⁹. Complications of the use of SES have not been reported yet due to its limited use. We have not experienced any major complication yet minor effects like irritation of airway can be potentially common. Further investigation of this device may highlight potential complicatinos in the future Based on our experience, we think that SES can be a useful, easy to use and safe device to be included as part of a proactive strategy for management of difficult extubations, specially in the management of Head and Neck Reconstructive surgery

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Acknowledges

Authors declare no external funding or conflict of interest
Written consent given by patient to use picture 1
Permission given by Cook Medical to use picture 2



Conclusions

- ✧ We consider the use of Cook SES as a safe way to maintain airway access after reconstructive intraoral H&N surgery
- ✧ We believe it is well tolerated when inserted nasally and can be maintained up to 12hr after insertion
- ✧ No major complications were associated with its use on our audit
- ✧ The SES has been widely accepted for use in our department
- ✧ Further investigation of this device is needed to identify potential complications