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Review

Laryngoscopy for thyroidectomy patients using a portable single use flexible laryngoscope (Ambu® aScope™ 4 RhinoLaryngo Slim): adaptation during covid-19 pandemic

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Abstract:

Introduction: Evaluating vocal cord mobility is important both before and after thyroid surgery but can result in excess hospital appointments which is unfavorable in the current COVID-19 era.
Aim: To describe and demonstrate a successful adaptation during the COVID-19 pandemic using a portable and disposable flexible laryngoscope for vocal cord assessment before and after thyroidectomy.
Methods: A description of practice over a 6-month period where the described adapted method was used for 26 thyroidectomy cases.
Results: Assessment of vocal cord mobility was performed in all cases with the portable disposable flexible laryngoscope without any issue and no adverse events were encountered.
Conclusion: The authors advocate the use of a portable disposable flexible laryngoscope used twice for each patient pre- and postoperatively in thyroid surgery for perioperative vocal cord checks due to the significant advantages in practicality, efficiency and safety; particularly during the covid-19 pandemic.

Keywords: thyroid surgery; laryngoscopy; vocal cord; covid-19; cost effectiveness; clinical improvement

Introduction:

The British Thyroid Association (BTA) recommends functional vocal cords assessment via laryngoscopy before and after thyroid surgery [1]. In most institutions, this is performed in an Otolaryngology outpatient clinic using either a reusable flexible video laryngoscope or a reusable eyepiece flexible laryngoscope with a stack setup [2]. This setup often means patients undergoing thyroid surgery have to attend additional clinic appointments or wait for the procedure to be performed in a ward clinic in the postoperative period. The authors have faced a significant reduction in clinic availability since the COVID-19 pandemic due to the time required to clean the clinic room between patients and for air circulation to take place in cases of aerosol generating procedures (AGPs). There is ongoing debate as to whether flexible laryngoscopy should be classed as an AGP or a just a potential AGP as it can cause coughing and sneezing [3]. Using technology to minimise the need for clinic attendances had been encouraged since the outbreak of the COVID-19 pandemic to reduce rates of transmission and reduce the risks to potentially vulnerable patients [4].

The Ambu® aScope™ 4 RhinoLaryngo Slim is a disposable laryngoscope designed for flexible laryngoscopy that has recently been economically assessed in comparison to a standard setup in the UK and found to be comparable and perhaps even favourable both in practicality and cost when maintenance, cleaning and clinic setup is taken into account [2]. This scope comes with a reusable, wipeable portable HD monitor that allows image and video capture and media transfer to other devices.

Aim:

To describe and demonstrate a successful adaptation in our practice performing pre- and postoperative laryngoscopy for thyroidectomy patients with a portable flexible laryngoscopy system using disposable flexible laryngoscopes. To raise awareness among colleagues about the availability of disposable flexible laryngoscopes for the benefit of thyroid surgeons and thyroidectomy patients worldwide during the COVID-19 pandemic.

Case Technique description:

Between the months of April to October 2020, the authors have performed 26 thyroidectomies with an adapted practice for perioperative vocal cord checks; using a disposable flexible laryngoscope in the operating department instead of performing flexible laryngoscopy in the ward or in

an outpatient clinic. In the authors' adapted practice, the Ambu® aScope™ is made available in the operating department and the HD monitor is attached to a stand with a hook to hang the laryngoscope in its packaging from (Figure 1).

Figure 1: The Ambu flexible laryngoscope and monitor

The scope is set up and used prior to the administration of the general anaesthetic to assess vocal cord function. As intubation is considered to be an AGP, performing flexible laryngoscopy at the same time reduces the need for another potential AGP in a different clinical area. The scope is then placed back in its packaging and kept with the monitor ready to use again after the surgical procedure. The corresponding patient label is made visible on the partially closed packaging so that all team members can recognise that the scope has been used but not to be disposed of yet. As this scope is disposable, formal traceability documentation as with reusable scopes is not required. The same scope is used again on the same patient to recheck vocal cords function following the surgical procedure after extubation either in the operating theatre or in the recovery room. The scope is then disposed of safely.

Discussion:

So far, in the authors' practice with this new setup, no adverse events or significant disadvantages such as poor image quality, safety issues or equipment failure have been observed. The advantages encountered by switching to this method in the case series described are numerous and benefit both the surgeon and the patient. Firstly, as the examination is performed immediately prior to the operation, the vocal cord mobility assessment is as up to date as possible and can be included in the operative documentation. The patient does not need to wait for a repeat examination whilst recovering postoperatively and this is one less barrier to a timely discharge of the patient from the hospital. There is also less burden of outstanding tasks postoperatively for the thyroid surgeon. Furthermore,

the option of following up patients remotely with a phone or video consultation is made possible as an internal examination is usually not required again. This is a practice that should be encouraged during the COVID-19 pandemic [4] to reduce the risks to patients. Following-up these patients by telephone or video also frees up precious face-to-face clinic appointments for other patients.

In cases of abnormal vocal cord movement being evident, the process to capture this via photograph or video using the HD monitor is simple and can be easily transferred to the patient's electronic record using an encrypted USB device. Although flexible laryngoscopy may not be considered to be an AGP, it can cause coughing and/or sneezing which do produce an aerosol [3]. It could therefore be argued that effort should be made to ensure flexible laryngoscopy is performed in an appropriate environment and performing this procedure before and after intubation and extubation may be sensible. Many operating theatres are designed to have high air turnover [5] and this would also favour performing flexible laryngoscopy in this environment compared to in a clinic room. The authors have also trialed using a reusable portable eyepiece endoscope to perform pre- and postoperative vocal cord checks but have found this to be an unfavourable method due to the required proximity of the examiner to the patients' mouth and nose and the high demand for this piece of equipment to be available for the on-call ENT team to use for emergencies requiring this equipment. The stack system and light source used with the non-eyepiece reusable flexible laryngoscopes in the authors' institution are far more cumbersome as a portable method of examination compared to the Ambu® aScope™ 4 RhinoLaryngo Slim and would not be a realistic alternative unless they were made to be more mobile, less space consuming and reprocessing was made possible between different locations.

The cost comparison study [2] based their conclusions of cost effectiveness on the price of £105 (GBP) per single use flexible laryngoscope versus an eyepiece and video laryngoscope setup in various clinical environments. Their cost estimates per use of reusable laryngoscopes ranged from £75 per use (for an eyepiece scope in the outpatient clinic) to £178 per use (for a video laryngoscope in an acute surgical assessment unit). These estimates took capital, repair, and reprocessing costs into account. The authors feel that this information is likely to be transferable to their own institution as this is also a UK NHS hospital with similar setup. Furthermore, authors believe that the Ambu® aScope™ 4 RhinoLaryngo Slim will be priced at £105 for Scottish NHS boards, matching the comparison study [2] at St. George's Hospital, London. The cost comparison study did not comment on using the same disposable scope twice for the same patient, but the authors feel it would be safe to assume that this would only enhance any potential cost saving, particularly due to the reduced need for patients to reattend an outpatient clinic for this procedure. It is noted that there may be concerns with a negative environmental impact from the excess waste of disposable endoscopes, but a study conducting an environmental comparison between single use and reusable bronchoscopes [6] found that the disposable scopes did not cause a worse environmental impact than reusable scopes due to the cleaning and reprocessing required for the latter.

Finally, this adapted technique may not be suitable for non-ENT thyroid surgeons who are not trained in flexible laryngoscopy and rely on the ENT outpatient service to provide vocal cord checks for their patients. However, as many anaesthetists are trained in flexible laryngoscopy, it would not be impossible for non-ENT thyroid surgeons to adopt this practice with help from their anaesthetic colleagues as long as the clinical findings can be interpreted.

Conclusion:

In summary, the authors advocate the use of a portable single use flexible laryngoscope (the Ambu® aScope™ 4 RhinoLaryngo) with HD monitor setup for use in thyroid surgery for perioperative vocal cord checks due to the significant advantages in practicality, efficiency and safety; particularly during the covid-19 pandemic.

Conflict of interest:

None

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