



Don't Be An Obstructionist

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1. Case Presentation:

A 47 year-old male with a mature tracheostomy presented for spot grafting of multiple sites following excision and grafting for thirty-six percent total body surface area thermal burns. Despite previous stability on room air, the patient became hypoxic and difficult to ventilate following a combined inhalational and intravenous induction. Bronchoscopy revealed a previously unrecognized, fixed obstructive mass immediately distal to the tracheostomy tube, which was later determined to be granulation tissue. The patient was woken up, placed in an upright position, and resumption of spontaneous ventilation was achieved with improvement of both oxygenation and ventilation.

2. Special Considerations for Tracheostomies:

Tracheostomy Characteristics:

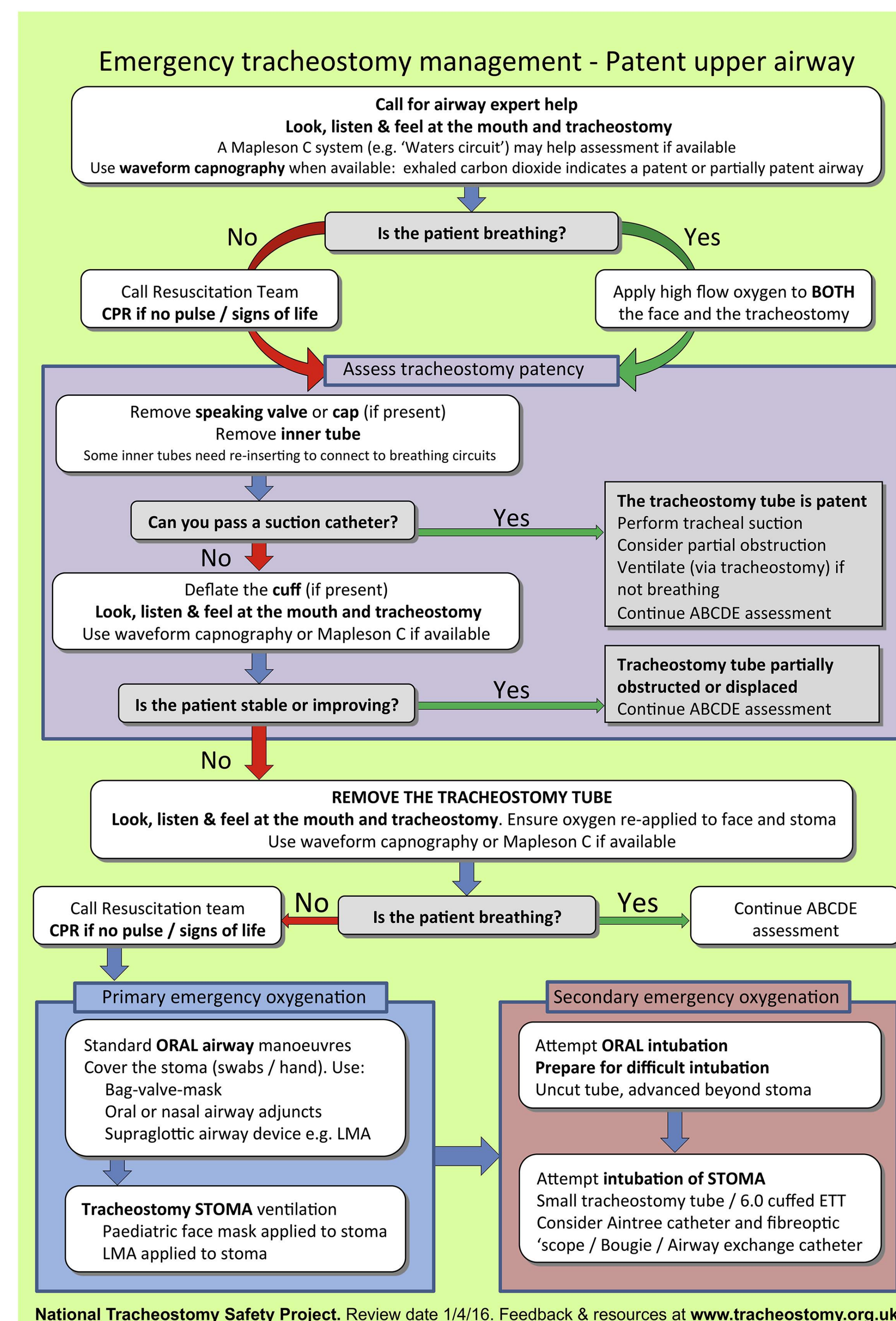
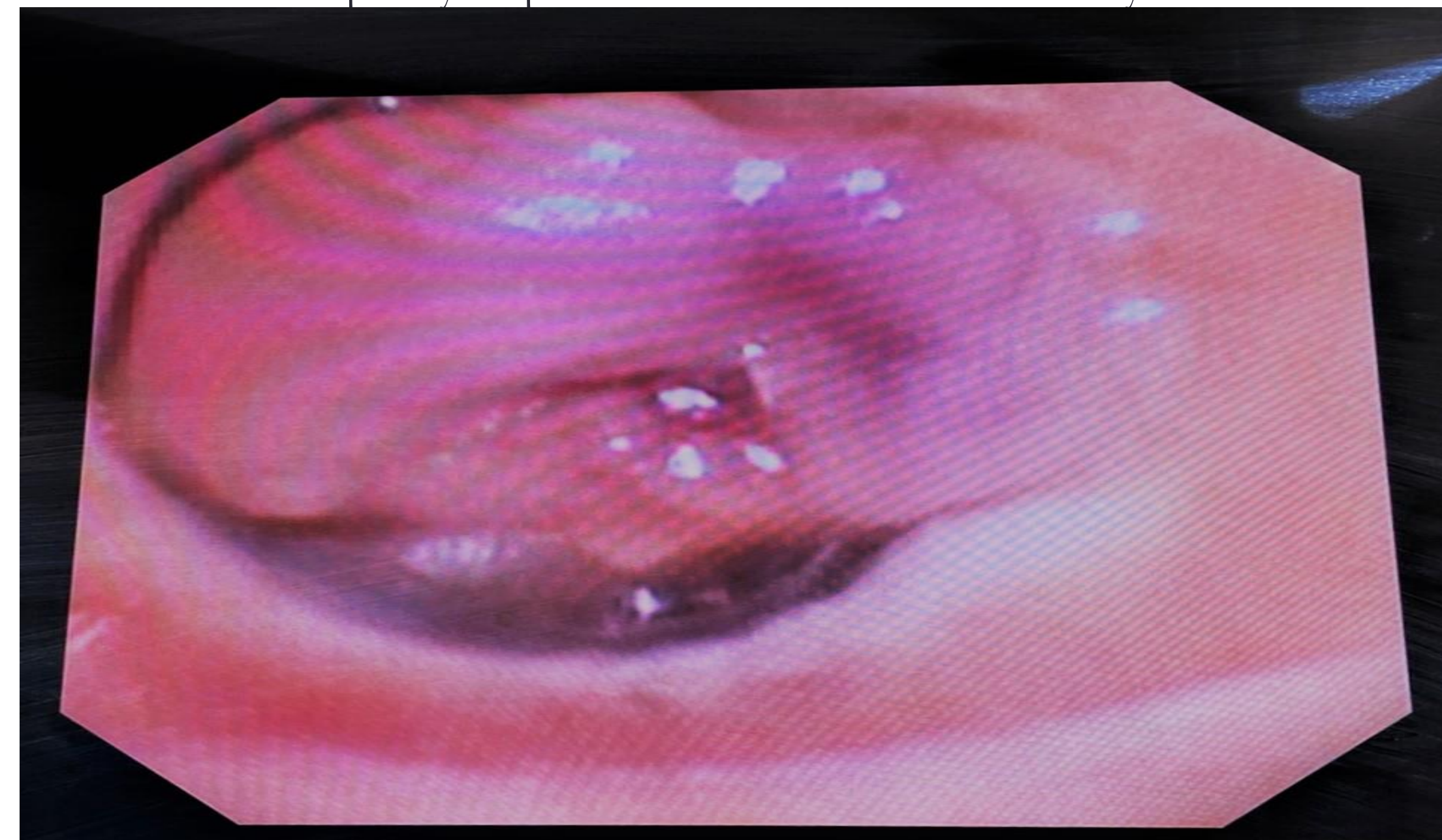
- Size
- Age of Tracheostomy (recent placement vs. well epithelialized)
- Presence/absence of cuff
- Presence/absence of fenestrations
- Presence/absence of sutures and/or flaps

Patient Characteristics:

- Quantity and quality of secretions
- History of complications (stenosis, occlusion, fistulization)
- Ability to access airway from above (presence of upper airway compromise or facial trauma)

Complications associated with tracheostomies:

- Occlusion/stenosis
- Accidental decannulation
- Tracheo-arterial fistula formation with hemorrhage
- Aspiration
- Tracheal necrosis



3. Perioperative Tracheostomy Precautions

- Ensure obturator is readily available in case of inadvertent decannulation
- Ensure cuff is inflated if present, or consider replacing with an uncuffed tube for if unable to appropriately ventilate
- Be prepared for an oral intubation and surgical airway

4. Outcome

The patient was scheduled for excision and spot grafting of residual burns. He had a mature, 19 day old tracheostomy with a 6.0 cuffed Shiley in place. The patient was hemodynamically normal with an oxygen saturation greater than 95% on room air.

The patient was premedicated with 2mg midazolam and preoxygenated. Tracheostomy cuff was inflated and a combined inhalational and intravenous induction was performed with 4% sevoflurane and 40 mg propofol, respectively. During induction, end tidal CO2 and tidal volume measurements appeared diminished. The patient's oxygen saturation subsequently decreased to to 85%. Significant airway resistance was felt during manual ventilation without improvement of oxygen saturation. An Ambubag with PEEP valve at 10L O2 was subsequently utilized with continued resistance during ventilation with eventual improvement of oxygenation. Trachestomy suction attempts were limited due to inability to pass 18F and then 14F catheters through the tracheostomy. Intraoperative bronchoscopy revealed a near obstructive mass located immediately distal to the tracheostomy. An intraoperative ENT consult was placed.

After several minutes, the patient resumed spontaneous ventilation and emerged from anesthesia. He remained hemodynamically stable with continued oxygen saturation above 95%. The surgical procedure was cancelled and he was transferred to the ICU for observation. A formal airway exam by ENT in the sitting position revealed granulation tissue distal to the tracheostomy site that was appeared small and nonocclusive when the tracheostomy was removed. ENT concluded that in the supine position, that the granulation tissue was pushed down by the tracheostomy in create a nearly occlusive mass obstruction. Recommendations for subsequent surgical procedures included decannulation with endotracheal intubation versus replacement of current tracheostomy tube with and extra long tracheostomy tube to bypass the granulation tissue. Tracheostomy exchange was deemed the safest option for his last surgical procedure and the patient was subsequently decannulated post-operatively.

References:

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Lewith, H., & Athanassoglou, V. (2019). Update on management of tracheostomy. *BJA Education*, 19(11), 370–376. <https://doi.org/10.1016/j.bjae.2019.08.002>