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Novel technique using Surgical Scrub Sponges to protect the nose and face during prone ventilation

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Introduction

COVID 19 in particular affects the lungs causing an ARDS type picture resulting in an atypical form of ARDS whereby there is disproportionately poor oxygenation despite reasonably preserved lung compliance in the early stages¹. Experience from Italy and China suggests that nursing the patient in a prone position is potentially beneficial and can improve outcomes when carried out in the early stages of the disease^{1,2}. This has resulted in its inclusion in several international guidelines and adoption around the world as a valid intervention for COVID 19 patients³

Proning is not a new phenomenon and has been used as a treatment option for ARDS for over 20 years. It is not without complications and as well as the displacement of tubes and lines, the exacerbation of existing traumas or dehiscence of surgical wounds there are also reports of pressure necrosis secondary to prone positioning particularly of the face and nose⁴A cochrane review in 2015 concluded that prone ventilation was directly responsible for an increased risk of pressure sores⁵There is some suggestion that the pressure damage caused by proning occurs regardless of preventative measures put in place (such as foam supports and measures to relieve pressure)⁴But it also seems that this pressure damage is often mild and self resolving⁶. Regular repositioning of the head may also reduce pressure damage accordingly⁷

Given that larger numbers of patients are likely to be proned and that proning is directly linked to pressure damage to the face and nose it would seem logical that this would represent an increase in referrals to ENT to assess this. Anecdotally this is the case in our department where we have received several such calls having never previously encountered this complication in routine practice. Although patients should be proned with the head turned to one side to avoid such pressure damage⁸ due to the highly unstable nature of COVID 19 patients and in some cases limited cervical spine rotation inevitably some patients will end up in positions where their nose is at risk. We present our approach to the management of these injuries borrowing from theory and practice used to manage patients having undergone rhinological procedures.

Technique

Our approach focuses on the following:

1. Easily accessed readily available materials – Given the demand healthcare services are under around the world a complex and expensive solution requiring multiple bespoke components is not desirable.
2. Respectful of surrounding structures – If not applied with consideration of surrounding structures you risk swapping nasal injury for corneal or labial

3. Easily Monitored – Proning presents a significant challenge for visualisation of the nose and eyes, bulky padding risks obscuring the affected area preventing monitoring. Skin breakdown and infection are a real concern with pressure damage in this area.
4. Easily Adapted – A bespoke solution for each patient may be effective but will also be expensive and likely to take time to produce/acquire

Surgical sponge has already been described as an appropriate material to immobilise and protect delicate grafts⁹ and it is our practice to also make use of it in the early stages of recovery post rhinectomy. It is our opinion that surgical scrub sponges meet the criteria set out above and represent an effective method of pressure relief in patients being ventilated prone:

1. Easily accessed readily available material – these sponges are available in all operating theatres and are bought in bulk at relatively low cost
2. Respectful of surrounding structures – the sponges can be adjusted and cut to avoid nearby structures
3. Easily monitored – the 3 part design allows the sponge to be moved and the nose viewed
4. Easily Adapted – can be cut to any size and additional sponges can be added to account for larger anatomy

The steps taken to measure and apply the sponge are detailed in figure 1.

The solution can be seen in figure 1 and 2. Figure 2 demonstrates that because the sponges are only secured together at one edge they can splay slightly allowing pressure to be re-distributed and stopping the sponge bulging and encroaching on the eyes.

Conclusion

We describe a simple technique to relieve pressure from the nose and face in patients who are ventilated prone. The technique focuses on low cost easily available materials, that allow easy monitoring of the area and is easily adapted to the individual patient. With the increasing use of prone ventilation to treat COVID-19 it is our feeling that this may reduce the incidence of proning induced pressure injury to the face and nose.

Key Points

- COVID-19 has resulted in increasing numbers of patients ventilated prone
- A known complication of proning is pressure damage to the nose and face
- Although patients should ideally be positioned with the head turned this is not always possible
- Techniques to relieve pressure from the face and nose are essential and can be achieved with a simple and low cost intervention

Figure Legends




Figure 1: Step by step approach to cut surgical sponge to appropriate size and fit to the patients face

Figure 2: Lateral view of the sponge in situ

Figure 3: Top down view of the sponge in situ this demonstrates the slight splaying of the three sponges to distribute pressure.

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<p>Step 1</p> <p>A layer of non-adhesive mesh dressing applied where possible with antiseptic/antimicrobial properties. In our department we routinely use paraffin impregnated cotton and viscose weave (Jelonet, Smith and Nephew, Watford United Kingdom) or iodine impregnated viscose weave (Inadine, 3M KCI, San Antonio, Texas, USA) this prevents the sponge, sheets and lines from sticking to or abrading the traumatised skin</p>	
	<p>Step 2</p> <p>Size of nose estimated and number of sponges required calculated</p>
	
<p>Step 3</p> <p>Sponge separated from plastic baseplate and baseplate discarded</p>	<p>Step 4</p> <p>Sponge placed against side of nose and shape of nose traced and then cut out from long side of sponge ensuring a minimum of 15mm of sponge remains at the point which will be in contact with the bed</p>
