The RCoA 'Facing Africa' Difficult Airway Fellowship

Alice Braga
University Hospitals Bristol

Jo Gordon
Sheffield Teaching Hospitals

Ethiopia has over 80 spoken languages. Communication can be difficult and sometimes patients are unable to talk due to facial deformities.

The RCoA currently funds a senior anaesthetic trainee each year to travel to Ethiopia with the charity 'Facing Africa' and join a surgical team offering facial reconstruction for noma survivors. Joanna Gordon and Alice Braga were awarded the first two fellowships (2013 and 2014 missions respectively). Here they describe the work undertaken on the mission and share the unique opportunities the fellowship offers.

Noma

Noma, derived from the Greek word 'to devour', is a devastating, infectious orofacial gangrene of uncertain aetiology, which affects the most malnourished of the world's population. It mainly occurs in the 'noma belt' of sub-Saharan Africa and characteristically affects children in the weaning period. Due to the political and health infrastructures of the countries worst affected, the true burden of noma is unknown. Global yearly incidence of up to 140,000 cases has been suggested by the WHO, with a mortality rate of up to 90%.[1] Those who survive the acute phase of the disease are left with not only the functional and aesthetic sequelae of the disease itself (trismus, ankylosis, oral incontinence, teeth extrusion, speech difficulty, and extreme disfigurement) but often suffer rejection by their communities and the consequences of 'traditional' noma remedies including application of battery acid.

Facing Africa

Facing Africa[2] (FA) is a UK based charity which sends a multinational surgical team twice a year to Addis Ababa, to perform complex procedures aiming to improve appearance and function for noma survivors, at Myung Sung Christian Medical Centre (MCM). Patients are recruited from Ethiopia and surrounding countries by local FA representatives. Two weeks before the surgical team arrives, patients gather at Facing Africa House (FAH) in the beautiful grounds of the Leonard Cheshire Home, Menangesha, just outside the city. FA medical staff (two nurses and a junior doctor) perform thorough pre-operative preparation. They also coordinate translation services to address patients' concerns and teach basic hygiene. After surgery they provide rehabilitation with wound care, physiotherapy and psychological support. In total patients spend eight weeks with FA. Patients are followed up at six-month to yearly intervals and often require multiple procedures undertaken in a staged manner over subsequent trips.

Logistics

When the surgical team arrives, two weeks into the mission, they have 48 hours in which to assess all the prospective patients, plan the lists, and set up the hospital facility. The anaesthetists document a specific airway strategy (Plans A to D) for each patient listed. Following the challenging task of clearing customs, the equipment and drugs are unpacked and organised in a storeroom. The logistics of setting up the anaesthetic equipment for surgery is challenging. Without an operating department practitioner, anaesthetists are responsible for ensuring that the anaesthetic machine, intravenous fluids, suction, warming equipment, drugs, operating table and all equipment for the individualised plans are all checked and ready to use each day. To avoid losing carefully allocated stock, equipment and drugs for each case are transported to the two theatres immediately before use. The locked storeroom is some distance from theatres so it is important to have everything to hand before commencing anaesthesia. Between cases responsibility for cleaning equipment lies with the anaesthetic team, everything from fibrescopes to suction canisters.

There are frequently technical faults to address. The fellows experienced problems with both FA equipment and the anaesthetic machines loaned by MCM. In 2014 a defunct ventilator meant a patient underwent a nine-hour free-flap procedure spontaneously breathing. A

Noma: from the Greek 'to devour'

Team effort: Asleep nasal fibreoptic intubation following awake cricoid cannulation and Ventrain™ ejector ventilation

Penlon ventilator held in the store at FAH was pressed into service as a replacement the next day; the problem of an incompatible connection with the scavenging system was solved after much head scratching by a conduit fashioned from two surgical gloves.

The patient and the airway

Ethiopia has over 80 spoken languages. FA uses translators; for consent, post-operatively and at follow up, but they are not available in the operating theatre. Communication can be challenging and some patients are unable to talk due to facial deformities. The noma airway presents a variety of potential challenges, all of which the fellows encountered. Facemask ventilation can be a problem owing to large midface defects. Trismus and ankylosis of the temporomandibular joint often preclude laryngoscopy. Patients returning for second or third-stage procedures present their own issues often with limited mouth opening due to their first stage flap procedures and recurrent trismus. Traditional remedies such as acid cause skin tethering affecting face and neck. The patients are mainly young and surprisingly robust. Most patients, even with free flaps leave recovery within an hour and mobilise early. The majority are discharged from the hospital to FAH within a couple of days.

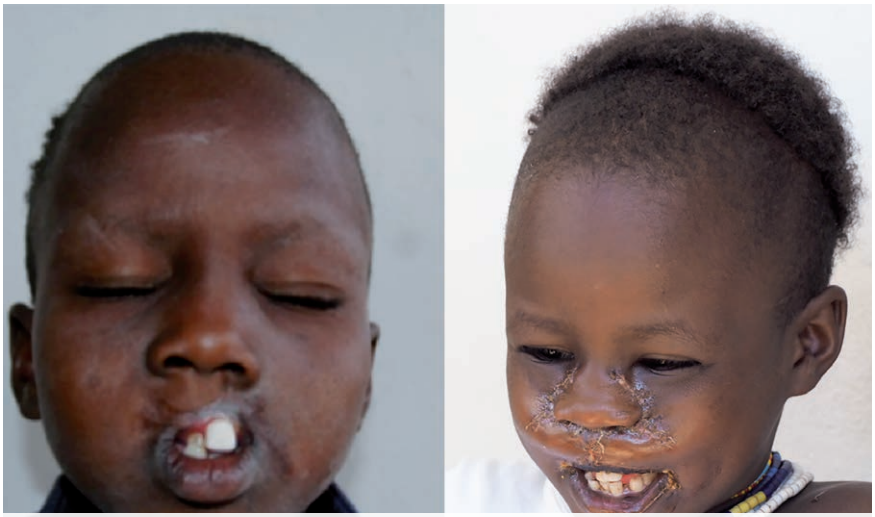
Difficult airway equipment exceeds that available in some NHS Trusts. Techniques employed include:

- Oral and nasal fiberoptic intubation.
- Video laryngoscopy.
- Laryngeal mask airway and Berman airway as conduits for fibreoptic intubation.
- Preemptive needle cricothyroidotomy.
- VentrainTM (P-3 Medical Bristol, UK) ejector ventilation.
- The Bailey manoeuvre (exchange of LMA for endotracheal tube for emergence).
- Management of high risk extubation.

Anaesthetic management

Fellows are encouraged to lead cases. The majority of patients receive anaesthetic care similar to that in the UK: general anaesthesia with propofol and isoflurane. Neuromuscular blockade is given before facemask ventilation. Apnoeic oxygenation (oxygen delivered at 3l/min via narrow-bore tubing) extends airway management time by up to ten minutes. The mainstay is flexible fibreoptic-guided tracheal intubation; the Storz Telepack system allows all team members to view the intubation sequence. Ambu-scopes are available for Hepatitis/HIV sufferers. When mouth opening is acceptable (greater than about 20mm), a videoscope may be used. Awake airway management is reserved for those patients where facemask ventilation is predicted to be unsuccessful, usually due to large midface deficits preventing an effective mask seal. Emergence, tracheal extubation and recovery is a hazardous time. For high risk patients, for example with Abbe flaps, (the mouth is effectively closed), a precautionary narrow-bore cricothyroid cannula is placed during facemask ventilation. Tracheostomy is not chosen because of the currently unacceptable risks of post-operative airway loss. All airway management episodes are archived into a database for review. Due to limited ward analgesia, linguistic communication barriers and no resident anaesthetist, careful acute pain plans are required. Analgesia is achieved with perioperative clonidine, morphine and ketamine, with paracetamol and nonsteroidal anti-inflammatories continuing on the ward. Regional anaesthetic techniques are common, performed using landmark techniques and nerve stimulators. Monitoring as per AAGBI guidelines is routine. Overnight, Ethiopian nurses staff the ward, but the team return each evening to review patients and address any pain issues or post-operative complications, remaining contactable out of hours to tackle any problems.

Bubble-blowing physiotherapy



7-year-old Nyalite before and after surgery

Non-technical skills

The fellowship offers an excellent opportunity to refine and implement a range of anaesthetic non-technical skills (ANTS). Reducing the likelihood of accidents and incidents in the context of the mission requires FA fellows to demonstrate enhanced skills in task management, team working, and leadership as well as cognitive skills such as situation awareness and decision-making. Planning and preparing each case, prioritising, and ensuring standards match those we aspire to in the UK are task management abilities expected of the fellow. Working with the multilingual, multicultural teams from Europe and Ethiopia can be challenging. Good team working skills are essential to ensure effective communication and maintain patient safety. Strategic airway planning is fundamental to the patients' safe anaesthetic management. Identifying all the options, balancing risks and continuous re-evaluation fulfils the decision making abilities set out by the ANTS system. Facing Africa has visited Ethiopia over 15 times and treated over 500 patients. There has never been a perioperative death, despite the risks encountered. FA consistently achieves >95% success for Plan A, and has not, to date, failed to manage an airway.

Saying goodbye

On the final day of the surgical phase the surgical team travels to FAH. Here they are reunited with all the patients for a review clinic followed by a party Facing Africa style; sack races, tug of war, football and dancing to hiphop are all on the menu. This is the highlight of the trip; patients preparing to embark on new lives with huge physical and psychological improvement. Sights such as the patients blowing up balloons with new mouths and laughing as they taste cake formed priceless memories us.

Summary

The Facing Africa fellowship offers the challenges of anaesthetising patients with advanced head and neck pathology for facial reconstruction in a developing world context. The experience has been truly rewarding for us as RCoA fellows, teaching us strategic airway planning, technical skills, teamwork, and organisational skills beyond anything we had previously undertaken in the UK. Importantly these skills are transferrable to our UK practice. We highly recommend the fellowship, we thank the RCoA for recognising its value and are most grateful to the Facing Africa team and its patients for the fantastic and unique experience.

Equipment has been donated, discounted or loaned by Aircraft Medical, Intavent Direct , P-3 Medical, Storz Medical and Trucorp.

Acknowledgements

We thank our patients, the founders of FA (Chris and Terry Lawrence), all the FA staff, the RCoA for supporting our Fellowship and our mentors: Drs David R Ball, Grant Rodney and Bill Hamlin and Gro Hotvedt

All patients consented for publication.

Reference

1 Coupe M et al. Airway management in reconstructive surgery for noma (cancrum oris). *Anesth Analg* 2013;**117**:210–217.

2 Facing Africa (www.facingafrica.org) (accessed 13 August 2015).