The Royal College of Anaesthetists ‘Facing Africa’ Fellowship funds one anaesthetic registrar each year to travel and work with the charity Facing Africa in Addis Ababa, Ethiopia, with the intention of developing skills in the management of difficult airways and to experience medicine in the developing world.

Noma, known as ‘the face of poverty’, is an infective necrotising orofacial stomato-gingivitis affecting severely malnourished children living in the ‘Noma belt’ of sub-Saharan Africa and areas of extreme poverty worldwide. Due to lack of basic medical resources the mortality rate reaches 80-90%. Survivors suffer massive facial deformity, dental extrusion and trismus that all hinder nutrition, and social outcasting and isolation result from the disfigurement and speech impediment. In Ethiopia Noma is seen as a curse and may be treated with traditional healing methods, such as battery acid to the face, exacerbating existing problems. The burden of disease is unknown because the vast majority never present to medical services, but up to 140,000 cases are seen annually worldwide.

Facing Africa is a UK charity founded by Chris Lawrence in 1998 to raise awareness and treat the consequences of Noma in Ethiopia. A team of volunteers (surgeons, nurses and anaesthetists) travels to Addis Ababa twice a year to perform complex facial reconstructive surgery to improve function and appearance of these patients, and I was privileged to join the team in October 2015.

**Logistics**

Facing Africa employs several Ethiopians based in Addis Ababa whose job it is to travel the country, often to very remote villages, seeking Noma victims and offering them surgery. Patients arrive at Facing Africa House (FAH), part of a pre-existing polio rehab centre on the leafy and temperate outskirts of Addis Ababa, 2 weeks prior to the arrival of the surgical team. Some may travel only a few miles whilst others will walk for several days to be here. A few will travel from as far as South Sudan and Mozambique. A team of Facing Africa nurses and an Ethiopian junior doctor prepare them for surgery with explanations and consent process, improved nutrition, and perhaps above all, an opportunity to meet and mix with other Noma victims and feel included within a small community, something most will never have had before. Pre-operative bloods and any required scans are obtained. Facing Africa House also provides the venue for on-going post-operative rehabilitation for a month after hospital discharge, and planning for returning home.

Arriving in Addis with the surgical team on the morning of the first Saturday, fresh from an overnight flight and disembarking into the thin polluted air at 2300m above sea level with a team of new colleagues and unknown expectations for the fortnight ahead brought a heady mixture of exhaustion, apprehension and excitement. After an hours drive across the chaos of Addis, the welcome from the nurses and prospective patients at FAH, the building resplendent in balloons and welcome banners, was extremely moving. A day and a half later we had seen 62 patients, some as follow-up from previous surgical missions, most presenting for primary or repeat surgery, and some who were not suitable for operations. Detailed anaesthetic assessment was carried out on all patients listed for surgery, using translators to unravel the 84 languages and 200 dialects spoken in Ethiopia. All patients were ASA 1, slim and had rarely had any medical attention previously. Comprehensive airway assessment and detailed airway management strategies were formulated and documented for each patient as plans A-D.

It is perhaps a marker of Facing Africa’s success that many people got wind of our arrival and turned up at the doorstep in the hope of having surgery. With problems ranging from longstanding leg deformities and terrible burns contractures to small lipomas, many had to be turned away. However, Facing Africa teams are now dealing with many pathologies other
than Noma, including facial tumours, trauma and an ever increasing number of facial injuries caused by hyena attacks (hyenas live alongside humans throughout Ethiopia, both in rural and urban areas).

The Hospital

Facing Africa rent a ward and 2 operating theatres from MysunSung Christian Medical Centre (MCM) in Addis Ababa. Patients travel in from FAH on the day prior to surgery and stay on the ward for as long as necessary post-operatively prior to transfer back to FAH for on-going recovery and rehab. We were lucky this year to have the first use of 2 brand new theatres and anaesthetic machines. First impressions were of gleaming new spaces and equipment, but on closer inspection it was evident there was still no air conditioning, the scavenging didn’t work and the ventilators were rigged back-to-front! Whilst this was not strictly ‘developing world anaesthesia’, we still needed to keep our wits about us. Depending on the cases, we had the ability to run 2 theatres in parallel, with 2 consultant anaesthetists, myself and a Norwegian nurse anaesthetist working between them. We anaesthetised 27 Facing Africa patients, as well as a handful of others to support the local plastic surgeon and provide support in difficult cases to local anaesthetists. Cases included rotational flaps (forehead and submental), free flaps (radial and fibula) and rib grafts for facial and nasal reconstructions, trismus release, split skin grafting, exploratory operations for post-operative infections, and removal and debulking of facial tumours. There was a great deal of interest in our work from local trainees, both surgical and anaesthetic, and some of our time was spent teaching on airway management. Also interested in our work were two films crews, one from a local news channel and the other making a documentary for the Discovery Channel, as well as an artist performing quick-fire sketches in theatre.

Anaesthesia

Facing Africa aspires to western standards of care and equipment despite the location, and as such, extensive advanced airway equipment is available to deal with the considerable difficulties encountered. Typical problems associated with Noma include trismus and TMJ ankylosis, facial soft tissue defects that require plugging with gauze to facilitate facemask ventilation, and facial scarring and distortion from prior surgery. At our disposal were 2 fibrescopes and a telepack system from Storz, a disposable Ambu fibrescope for use in patients with blood-borne viruses, McGrath MAC and Glidescope Ranger videolaryngoscopes, as well as standard Macintosh laryngoscopes, LMAs, tracheostomies and emergency cricothyroidotomy equipment. Fibreoptic intubations were exclusively carried out asleep, primarily due to the language barrier, but most of the airway pathology was anterior and fixed by scar tissue, so once through the affected area, airway navigation proved straightforward. We achieved airway management plan A in 100% of our patients, incorporating both nasal and oral fibreoptic intubation, videolaryngoscope-guided nasal and oral intubation, LMA bridging to both intubation and extubation, and pre-emptive needle cricothyroidotomy. Apnoeic oxygenation via simple oxygen tubing, either nasally or orally, was routinely used during fibreoptic intubation.

Most patients received pre-operative sedation with oral clonidine (buccal midazolam for children) on the ward and then walked to theatre. We had no facility for inhalational induction (halothane vapourisers in situ but no halothane or sevoflurane) thus all patients had intravenous inductions with propofol, morphine and atracurium. Isoflurane provided on-going anaesthesia, with paracetamol, diclofenac, ketamine and local anaesthetic for analgesia. We performed regional blocks for donor graft sites (axillary, fascia iliaca, sciatic) using landmark and nerve stimulator techniques (no ultrasound available).
We encountered one post-operative complication. An anxious 14-year-old boy had undergone a revision of nasal reconstruction with rib grafting with an uneventful intra-operative course. He had received both oral clonidine (3mcg/kg) and buccal midazolam (0.25mg/kg) as pre-operative sedation due to anxiety, to good effect. He remained drowsy in the recovery ward, but maintaining his own airway with normal observations. We were called to see him as an emergency after a reported respiratory arrest, requiring facemask ventilation for a brief period before resolution of his previous state. After spending the night under close observation on ICU, he made a full rapid recovery. We resolved not to use midazolam and clonidine in combination for the duration of the trip.

My role as the Fellow was similar to a senior registrar in the UK, working alongside 2 consultants with the ability to move between the 2 theatres to gain maximum experience. I was encouraged to take the lead role for cases when possible and given the responsibility of holding the anaesthetic on-call mobile phone overnight, ensuring that our team was contactable 24 hours a day in case of emergency. Each evening we would conduct an after-dinner ward round to ensure there were no new problems and the night staff were comfortable with the plans.

**Case Study**

Abel was 6 when a hyena attacked him in his rural Ethiopian village. He was dragged several hundred metres with his head inside the hyena’s jaws and down into the hyena set before his chasing mother pulled him by his feet from the hole in the ground. He lost an ear, his entire lower jaw and suffered skull fractures and soft tissue damage to his scalp. Miraculously, he survived to be operated on by an unknown Ethiopian surgeon who placed an NG tube and held his face in position with a metal plate.

We first met him on arrival in Addis when he appeared to be in excellent health, running around the grounds at FAH and interested in all around him.

Before travelling, Mr Kelvin Mizen, one of Facing Africa’s surgeons, had obtained support from a surgical company to produce a bespoke laser-cut mandible prosthesis from 3D CT scan reconstructions.

There was lengthy discussion amongst the multi-disciplinary team as to whether operating on Abel was possible, sensible, ethical, and whether it would change his outcome. It was felt that he would die without surgery and that we could offer potentially life-saving surgery, albeit at high risk.

Surgery took place on the first Thursday of the trip, utilising the entire team for 12 hours. He received buccal midazolam on the ward and was carried to theatre. After IV induction with morphine and propofol, initial airway management was with an LMA to assess ability to ventilate. This was successful, so after paralysis with atracurium he was intubated orally with the Glidescope, the armoured ETT being sutured to his nasal septum. Surgery proceeded with wound exploration and neck dissection which unexpectedly found his tongue fully intact, followed by taking a fibula flap, moulding the fibula to the mandible prosthesis, screwing this in place and re-plumbing the vascular supply. An implantable Doppler device was used, perhaps for the first time in Africa, to enable constant monitoring of flap blood supply post-operatively. His chin was reformed from the flap overlying the fibula graft and his tongue sutured to the front of his mouth. Further skin grafts were taken from thigh to lower leg.
He was taken to ICU late into the evening; I shall never forget the smiles and tears on his parents’ faces as they saw him for the first time. Fascia iliaca and sciatic blocks were performed prior to successful extubation around lunchtime. The need for elective tracheostomy had previously been discussed, but was not required.

After one return to theatre for wound checks, re-suturing and redressing, Abel left hospital for FAH the following Thursday, one week post surgery, and was gingerly mobilising a day later.

A month down the line, he is regaining speech and starting to take oral food whilst walking well.

### The Grand Finale

The final day of each mission is spent back at Facing Africa House, where we begun on the first day. We ran a clinic reviewing each patient who had undergone surgery, making plans for the coming days, weeks and months. This is done in close liaison with the local plastic surgeon, a Norwegian, who had helped in theatre over the previous fortnight, and who would review and operate on Facing Africa patients over the coming months as required. After a celebratory lunch, the afternoon was spent in a party atmosphere, with football matches, tugs-of-war, water balloons, tea, cake and photographs. It was incredible to see patients happy and more confident in their appearance, some of whom had ditched their white scarves previously used to hide their faces. It was reassuring to know that these patients wouldn’t now be cast back out to the community unsupported, but that Facing Africa continue to support them, and will often bring them back for repeat surgery over the coming few years to ensure the best possible results.

### Personal Experience

It has been a huge privilege to have the opportunity to work with Facing Africa. I have learnt and consolidated anaesthetic skills for the management of complex difficult airways and gained experience in major head and neck plastic and reconstructive surgery. Despite the developing world location, the skills and experience were all directly transferrable to UK practice: planning of airway strategies, practical skills, complex teamwork and human factors and overcoming communication difficulties. It was an exhausting, emotionally challenging and intense fortnight, but incredibly rewarding work that I hope to be able to return to in future years.

### Acknowledgements

Chris and Terry Lawrence and all at Facing Africa.

Dr David Ball for co-ordinating the Fellowship.

The Royal College of Anaesthetists, Dr Jo James and the International Programmes Department.
Competing Interests

Facing Africa has been given or loaned equipment by Intavent Direct, Storz Medical, Aircraft Medical, P-3 Medical, Cook Medical and TruCorp.

Consent

All patients gave written consent to the use of their photographs and medical details.

References


Dr Tom Bradley