

**A Report of Teaching Visit for Paediatric Urology and Surgery,
Nursing, Anaesthesia and technical support**

**Tikur Anbessa Hospital, Addis Ababa,
Ethiopia**

3rd March 2012 - 12th March 2012



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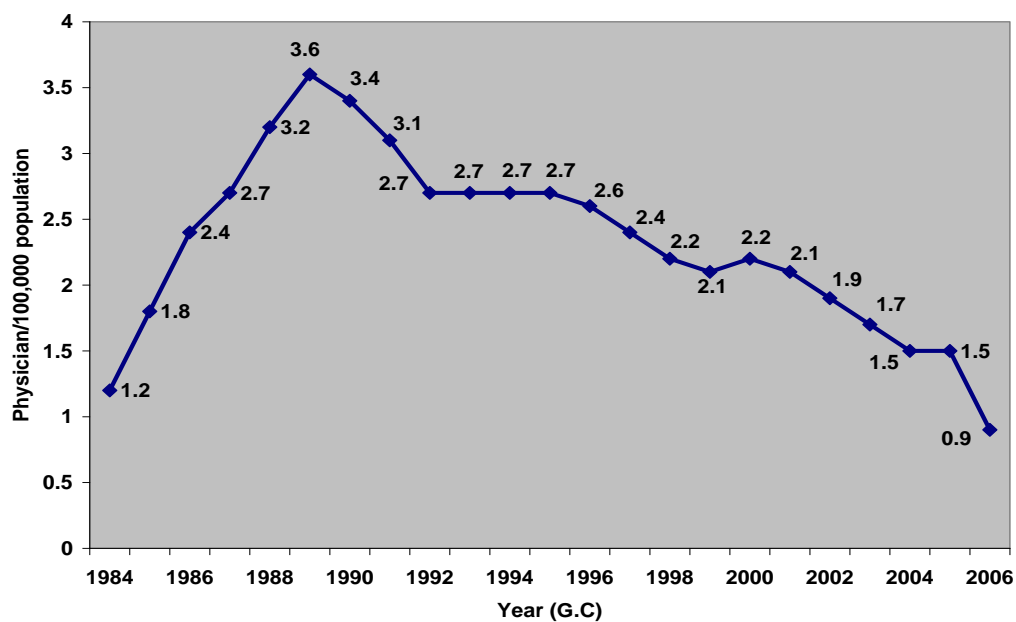
Introduction

The Kind cuts for Kids visited the Ethiopia twice in 2008 and once in 2009, developing a relationship with the Addis Ababa University, and the Black Lion Hospital, that has recently been renewed.

In 2012, 20 patients were reviewed 14 had surgery during which they had 51 procedures, given a total for the four visits to 227 patients reviewed, and 220 operations on 80 patients.

The Tikur Anbessa University Hospital of 560 bed central referral hospital, the Paediatric Surgical Unit is the only tertiary Paediatric Surgical Unit in the country of 75 million people. One hundred and thirty of the hospital beds (23%) are dedicated to Paediatric patients, 40 which are for elective Paediatric surgery admissions. There are only four trained Paediatric surgeons, only one of whom was in the hospital for the duration of the visit, one is in private practice and the third was on leave working for an NGO at the time. However, one must realise that that the manpower is so limited as to make participation in education visits difficult.

The Department of Surgery of the Faculty of Medicine, which is responsible for the training of general surgeons and undergraduate surgical education, has around 18 staff surgeons, two of whom are Paediatric Surgeons and one of whom is trained in general surgery. The numbers of doctors per population, in Ethiopia, has changed over the years, but not improved, making interesting reading, and bringing into relief the importance of “real” sustainability.





Resident medical staff and nursing staff from the Black Lion Hospital were an essential part of the success of the visit of the Kind Cuts for Kids team.

Paediatric Surgical Training Development

Ethiopia is now involved in Paediatric surgical training within the College of Surgeons of East Africa, and has two surgical registrars, one of whom was in hospital having had a baby on the day we arrived.

Surgical Teaching Sessions

Due to two of the Ethiopian Paediatric Surgeons not being at the Black Lion Hospital at the time of the visit, the clinical teaching sessions were limited, but were, appropriately focused on systemic issues such as theatre resource management, participation in guide-line development, theatre nurse training, and specifics of how to conduct research and publication.

The surgical topic discussed included:

1. Major hypospadias – bladder mucosal graft
2. Pelvic osteotomies in bladder exstrophy
3. Cosmetic outcome in bladder exstrophy
4. Bladder exstrophy closure
5. Laparoscopic diagnosis
6. Laparoscopy with limited resources
7. Intersex diagnosis and management
8. COPUM management
9. Tumour management
10. Percutaneous access
11. Managing the dying patients
12. Managing expectation of patients
13. Renal stone management
14. Caudal anaesthesia
15. Hirschsprung's radiological diagnosis
16. Caudal duplication
17. Urethral duplication
18. Radiation safety
19. Bowel obstruction
20. Sharps management
21. Operative field counting
22. Inventory management

Clinical Care

In total there were 72 contact episodes with patients, consisting of 51 operations related to the 21 patients (15 male) seen, 14 of whom had surgery, ranging in age from 3 to 300 months, 15 were male, and 5 of the 21 were over the age of 10 years for conditions that were present from birth.

Operations

Bladder exstrophy closure – 1; Bladder neck reconstruction – 1; Bronchoscopy – 1; Clitoroplasty -2; Closure of divided colostomy – 1; Closure of ileoileal fistula – 1; Closure of rectoileal fistula – 1; COPUM fulguration – 2; Cystoscopy – 7; Bladder Diverticulectomy – 1; Epispadias repair – partial; Gonadectomy – 2; Herniotomy - inguinal – 4; Laparoscopy – 1; Laparotomy – 3; Omphaloplasty; Osteotomy - anterior – 2; Osteotomy - posterior – 2; Pena – redo – 2; Vesical polypectomy – 2; Vesical polypectomy – 2; PUJ to bladder c Leadbetter Politano reimplant; Pyeloplasty – 1; Rectal resection – 1; Ureter reimplant – 2; Ureterocele – 2; Urethroplasty – 1; Vaginoplasty – 4; Vaginoscopy; Vesicostomy.

Diagnoses

PUJ Obstruction – 2; Intersex – 4; Anorectal anomaly – 2; Penile amputation; COPUM – 4; Multicystic kidney; Ureterocele – 2; Bronchial foreign body; Pelvic ectopic kidney; Abnormal verumontanum; VUJ Obstruction; Urethrovaginal fistula; Branchial fistula – high; Bladder exstrophy – 2.



A little girl immediately after her genital reconstruction surgery, then just after she had passed urine having had her urinary catheter out, which was a few days after the operation,



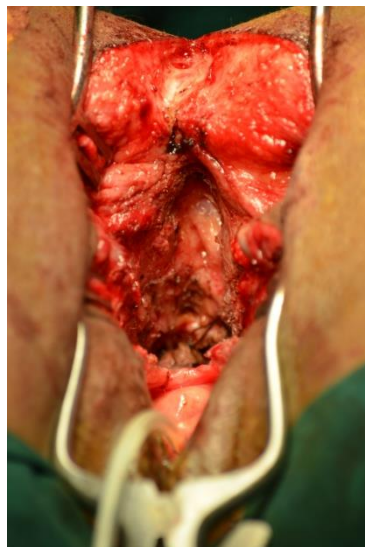
A girl with a vesico-vaginal fistula caused by a dummy she pushed into her vagina as an infant, leading to tissue damage and years of incontinence; She is seen before and after surgery. The radiograph shows the large stone and the dummy before removal.



A baby boy with a pelvic obstructed kidney, who is looked after by the great grandmother as both his mother and grandmother had died. He looks well after an operation that had fixed the complex anatomy seen in the radiograph on the right; an obstructed pelvic kidney sits on top of a small bladder.



A boy with the rare condition of bladder exstrophy, who was about to have a major operation including the fracture of his pelvis in four places, lies quietly on the operation table.



An 8 year old girl, born with an anorectal anomaly that resulted in complete bowel incontinence, required a 7.5 hour operation to fix her anatomy. Her smile reflects the faith in the treating team. The operative photo shows the depths we had to reach.

Anaesthetic Report

The anaesthetic machines were of a reasonable standard but because the hospital has no piped Oxygen or other gases, large portable tanks were used and had to be changed intra-operatively. Also, despite the scavenger not being connected to a suction outlet, it could be directed out of the window!

The department also had no air-conditioning which means no air exchanges which can lead to infections, and to keep the temperature down in the theatre a portable fan was used or a window opened.

Unfortunately Dr Gordon had to go home 4 days early, due to illness, but not before assisting with 7 anaesthetics, 6 that involved the use of caudal injection of local anaesthetic. The anaesthetic duration was 0.8 to 5.2 hours for the procedures he participated in and another took 7.5 hours.

Theatre and the conduct of anaesthesia observations

- 1) Infrastructure is not well maintained.
- 2) Intra-operative monitoring is not to Australian standard, eg - SaO₂, NIBP, ECG, temperature.
- 3) The old “Ohmeda” ventilator (for adults) was not suitable as the flow sensors did not work.
- 4) Oxygen was provided by “G” cylinders, making FiO₂ monitoring impossible.
- 5) Scavenging was passive through a pipe out the window, increasing room contamination.
- 6) The anaesthetic suction system was inadequate.
- 7) Recovery had been significantly improved from reports of previous visit:
 - i) Staffing levels are good.
 - ii) Oxygen is available.
 - iii) Monitoring is available for each bed space, including SaO₂, NIBP, ECG
- 8) Low concentration salt solutions were frequently used despite the risks.
- 9) Knowledge of physiology appeared below the level expected on Australian anaesthetic graduates.
- 10) Analgesics were limited, with only ketamine and per-rectal paracetamol in theatre.
- 11) Anaesthesia:
 - i) Was induced with the basic agents thiopentone and ketamine.
 - ii) Maintained by Halothane, although the more modern isoflurane vapouriser was present.
- 12) Muscle relaxation was achieved with intermittent succinylcholine. While cheap, this results in more episodes of movement than the Australian standard of Vecuronium.
- 13) Anaesthetic charts were crowded, but effective documents.

In general the anaesthetics given were a set style, administered always by an Ethiopian team of two, who had undertaken a 3.5 year diploma and an 18 month degree of Masters of anaesthesia. However, further education in anaesthetic machine function and physiology, particularly related to fluid management seems warranted. The principle points of teaching related to the workings of the machines, physiology, the use and technical details of injection of local anaesthetic into the caudal space for intra-operative and post operative pain relief. Continuous anaesthetist professional development would be an important feature of any assistance program.

Donated disposable anaesthetic equipment

Non Sterile Gloves Large, 2 boxes; ECG Dot Packages, 2 packages; 24G Optivas, 20; 22G Optivas, 30; 20G Optivas, 10; Guedel Airways, 10; IV Bungs, 30; Micro Pins, 48; 3 way taps, 10; Assorted ET Tubes, 40; Antiseptic hand Rub, 1; Anaesthetic Trays, 13; Artery Forceps, 2; Scissors, 2; IV Extension, 5; Intubating Stylets, 1; T piece, 1; Hyperfix tape, 1 box; Tegaderms, About 40; IV Giving sets Assorted, 20; 23G needles, 200; Spinal needles, 10; Epidural set, 1; 1ml syringes, 20; 10ml syringes, 20; Suction catheters, 10; Burettes, 6; Intubating Stylet Paeds, 3; Frovea paed, 1; LMA's Assorted, 30; S_aO₂ probes Paed, 20; Face masks, 20.

Donated anaesthetic related medication

Metronidazole 500mg/100mls; Ampicillin 1g vials; Gentamicin 80mg/2mls; Bactrim Suspension 100ml bottles; Bupivacaine 0.5% 20ml; Clonidine 150µg/ml; Adrenalin 1:1,000 1ml; Metaraminol 10mg/1ml; Ephedrine 30mg/ml.

Technical Assistant Report

The working environment was convivial and constructive, despite the significant limitations in Ethiopia compared to the facilities available in Australia, namely:

- 1) Multiple use of theatre clothing, face masks and diathermy handpieces.
- 2) Items not available
 - i) Absorbent underlay sheets (blueys).
 - ii) Patient gowns.
 - iii) Patient slide device or poles to transfer patients.
 - iv) Air conditioning – open windows exposed adjacent building site.
 - v) Sterile light handles to allow surgical team to adjust the theatre lights.
- 3) Patient transfer trolleys are difficult to clean
- 4) No sterile light handles (lights require refocusing by a third person)
- 5) Wandering theatre lights; unrepaired – fixed with a screw driver.
- 6) Two sink outlets in the theatre complex not connected to drains
- 7) At crucial times of an operation, providing added assistance to surgical team.
- 8) Assistants were occasionally called from the operating table without fully communicating their intended absence.
- 9) Little or no maintenance of equipment.
- 10) There are several pieces of surplus unusable equipment

Tasks performed went well beyond the usual scope of the usual technical assistant position in Australia. The highest priority was to ensure minimisation of the problems outlined above, including:

- 1) Ensuring instructions from the scrub team we acted on accordingly.
- 2) Repositioning theatre lights.
- 3) Sourcing instruments unfamiliar to Ethiopian theatre staff.
- 4) Moving patients.
- 5) Facilitating the correct positioning of assistance.
- 6) Moving crowded equipment to enable surgical staff move around the operating table.
- 7) To document the environment and cases photographically.
- 8) Enable the customs clearance of surgical equipment.
- 9) Provide support for observations and decisions by junior medical staff.
- 10) Transport of equipment into and out of the hospital.
- 11) Support to the anaesthetic staff.

Kim Clarke adds his personalized comment “*the team made a huge difference to the lives of 15 young children and their families in environment where the workload is such that the staff don't have time to review donated goods that are not part of their immediate need. Black Lion Hospital in Addis Ababa, Ethiopia operates in 'survival' mode*”.

Nursing Report

The wards are moderately dilapidated with plaster and light fittings hanging from the walls, little running water and mould on walls and ceilings. Also, there are only few nurses per floor, leaving children to rely on relatives for much of the nursing care, including monitoring urine output, and providing a supply food and clean water.

The main task of the nurse assigned to the mission was to organise equipment for each operation, ensure that the nursing staff were assisted with the operations, and to teach them techniques to improve the surgical outcome and equipment management.

The nurses appeared to have had very good training, but the lack of equipment and disposables, restrictions that significantly impact their scope to facilitate good surgery. For instance, while the main supply of instruments arrived in the theatre sterilised at the beginning of the day, many pieces of equipment that were reused would be regarded as “single use only” in Australia. These were usually prepared for the sterile field by soaking in a solution one of the antiseptics Formaldehyde or Glutaraldehyde. Two issues arise from such a practice, one is the safety of use in a non-ventilated environment (except when the window was open), the other the incomplete nature of the sterilization process. However, without soaking instruments, the ability to treat children would have been further restricted.

An additional resource limitation is the severe lack of linen. Scrub gowns for theatre have been worn so often that the cuffs are torn along the seams, and the gowns cannot be closed properly; there is also a limited supply of surgical linen for covering the patients during the operations, which does limit the number of cases that can be performed on any list and also prevents the provision of an adequate sterile and waterproof barrier during some cases.

Because of the high incidence of AIDs, there is awareness of the need to avoid needle-stick injuries, using taped cardboard boxes as makeshift sharps containers. However, there is no system for handling of suture needles and blades during surgery, which was devised and instigated. Overall, the basic theatre equipment is of poor quality, including:

- 1) Mobile stools that were missing wheels are still in use.
- 2) The 3-point bipolar diathermy had to be plugged into a monopolar single plug, as the machine bipolar machine had malfunctioned.
- 3) Yankeur suction devices, usually used at the time of extubation were not available – an anaesthetic safety risk.
- 4) Severe disposable stock items were past their use-by date.
- 5) Soap for staff to scrub prior to proceeding to surgery was in short supply.
- 6) Sutures, limited in supply compared to Australian, were better supplied than previously.
- 7) The soaking of the instruments appears to significantly shorten their lifespan.

Lindy Phillips adds the personalized observation “I would like to encourage any others with a yearning to do this sort of volunteer work to definitely pursue it. Not only does it benefit others, but it is a rewarding and humbling experience and I am grateful that I was given this chance”.

The Sponsors

Sutures were funded from a donation from the Preston Rotary Club. Funds were provided by the Manningham Rotary Club, the Society for Aid to Children Inoperable in Mauritius and various donations to Kind Cuts for Kids. The surgical staff of the Black Lion Hospital provided the transportation to and from the hospital and airport.

Instruments were donated by Life Healthcare, including:

- | | | |
|----|----------------------|-----|
| 1) | Plain dissectors | - 4 |
| 2) | Toothed dissectors | - 5 |
| 3) | Metzembourn scissors | - 3 |
| 4) | Vietlander retractor | - 1 |
| 5) | Needle holder | - 1 |
| 6) | Nurse scissors | - 2 |
| 7) | Magil forceps | - 2 |
| 8) | Sharp iris scissors | - 6 |
| 9) | Curved iris scissors | - 6 |

Recommendations

Paediatric Surgical Training

- 1) The recently developed curriculum should be enacted.
- 2) Resources should be expanded to train and support surgery for children.
- 3) The teacher of Paediatric Surgery will require assistance, which could be partly supplied by KCFK's
- 4) More junior staff should be assigned to assist with Paediatric surgery, to increase the students of the care of the children and thus expand the corporate knowledge of children's surgical disease.

Theatres and Surgery

- 5) More Paediatric Surgical and Anaesthetic services should be provided in Ethiopia.
- 6) The Black Lion Hospital and Addis Ababa University should further develop Paediatric Surgical and resuscitation teaching of resident and medical students.
- 7) Assistance should be sort for improved Paediatric endoscopic and other surgical and Anaesthetic equipment.
- 8) Ongoing assistance should be provided by the Kind Cuts for Kids Foundation, and others, for the development of Paediatric Surgery in Ethiopia, including the development of certification by the University for the specialty, in association with the College of Surgeons of Central and East Africa.
- 9) Community awareness of surgical disease in children should be enhanced.
- 10) Anticholinergic medication (Oxybutinin and Probanthine) should be made more readily available for the management of bladder instability and the neuropathic bladder.

Anaesthesia

- 1) Reinforcing fundamental points of care :
 - a) *Improve general hygiene* e.g. reusing syringes, no airway filters, hand washing, rubbish.
 - b) *Staff protection*: gloves, eye cover, sharps disposal.
 - c) *Thermoregulation*: of vital importance in peri-operative care.
 - d) *Organisation and order* of equipment for anaesthesia improves access and safety.

- 2) Practice evolution opportunities: *Caudal Analgesia*: need to train a trainer.
 - a) *Analgesia*: whilst this is resource limited there is a generally poor understanding of its importance in successful care and a lack of ownership of pain management.
 - b) *Laryngeal Mask Airways* – ideal, appropriate infrastructure such as patient selection, pharmacological differences make it less attractive, as does poor suction in the event of reflux.
 - c) Shift to *propofol* based induction.
 - d) Discourage *inappropriate use of Suxamethonium*.

- 3) What the local were most interested in:
 - a) Concise reference material - Oxford Handbook of Anaesthesia/Paediatric Anaesthesia.
 - b) Computer based reference material - documents, power point presentations and literature.
 - c) Pictorial in-theatre education opportunities from the laptop.
 - d) New techniques and drugs.



Organisational needs for KCFK's visits to Ethiopia

- 1) An Anaesthetist is an essential member of the team.
- 2) A scrub nurse should be included in the KCFK's team.
- 3) Disposable items of high importance for visits:
 - a. Sutures
 - b. Protective eye wear
 - c. Urinary Catheters
 - d. Cystoscope equipment
 - e. Tapes for catheters
 - f. Diathermy pads
 - g. Diathermy handles
- 4) Prearranged clearance through customs.
- 5) HIV emergency kit.
- 6) Protective eye-wear is an essential item of equipment and donation.
- 7) An associated should be developed with the airlines that travel to Addis.