

**A Report of Teaching Visit for Paediatric Surgery and Urology,  
Anaesthesia, Radiology and Nursing  
in the  
Tikur Anbessa Hospital, Ethiopia**

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## **Background**

The Kind cuts for Kids Foundation visited Ethiopia in January, developing a relationship with the Addis Ababa University and the Black Lion Hospital. Ethiopia has a long history of medical development, and a rich history of culture and religion, Abyssinia having been the focus of the development of the Christian religion, with the country having the oldest Christian Church.

The Black Lion (*Tikur Anbessa*) Hospital covers an entire city block on a street named after Sir Winston Churchill. Both new and old buildings make up the hospital complex, in a city that has pollution and a huge population. Progress and development are indicated by the large number of cranes atop partly finished buildings, and the soon to be open 23 story building, locate not far from the Black Lion Hospital.

Tikur Anbessa University Hospital is a 560 bed central referral hospital that provides general medical services for a city of over 3 million people, and those referred from other parts of a country of 75 million people, 44% of whom are less than 15 years of age. One hundred and thirty of beds (23%) are dedicated to Paediatric patients, 40 which are for elective Paediatric surgery admissions. The Black Lion Hospital is the only hospital providing tertiary Paediatric surgical services in Ethiopia.

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, one of whom is a Paediatric Surgeon and one of whom is trained in general surgery, but who helps provide the service. In 2004 there were only a total of 158 practicing surgeons in Ethiopia, compared to 48,000 doctors (240 per 100,000), and around 5,500 surgeons in Australia. These data show how far Ethiopia is from the minimum acceptable ratio of surgeons to population and indicates the need for specialty training in general, and subspecialty training in particular.

Medical development has been hampered by a number of conflicts and government changes, but even more-so by the brain drain that has come from the trained medical and nursing staff leaving for developed countries.

The visit of the Kind Cuts for Kids Foundation followed a request to assist with a young girl with spina bifida, a condition in which there are consequent neurological, orthopaedic, Urological and bowel problems. When details of this little girl were presented to the Australian team, it was recognised that a one-off surgical cure was not possible, and it was considered that educational input to the Ethiopian team would assist beyond developing a solution for the one child.

We dealt with the same group of doctors and nurses in Ethiopia as on the previous visit, with only the anaesthetist being a different team member for the Australian contingent. Prior to the visit in January 2008, Professor Milliard Derbew, Head of Paediatric Surgery and the Dean of the Addis Ababa, was contacted regarding the prospects of including Ethiopia in the Kind Cuts for Kids program, to which he eagerly responded. Subsequently, a visit of a team of a Paediatric Surgeon, an Anaesthetist, a theatre nurse and a Paediatric Radiologist was assembled. The Ethiopian team developed a program of teaching and clinical work, which included

identifying patients appropriate to the education program, mainly focussing on difficult cases of Paediatric Urology.

### ***Paediatric Surgical Unit***

The enormity of the Paediatric Surgical Unit task, at the Black Lion Hospital, is reflected in a published study of the throughput between September 1999 and August 2004. A total of 6070 surgical procedures were performed, accounting for 31% of all operations and 33 % of all Paediatric admissions to the hospital, defined as patients under the age of 12 years. Important to understanding the problems for the delivery of surgical care and training to children is the recognition that the Black Lion Hospital is the only tertiary care centre in the country.

Congenital anomalies form 37% of the workload in a patient population that is 66.5% male, with the gastrointestinal system most commonly affected system (41.8%), although Urological conditions are also common. During the period studied by Professor Derbew, 5,842 children were admitted for surgery, with a mean age 68 months.

Of the congenital diseases relevant to the Kind Cuts for Kids, during the study period, included the those of the gastrointestinal system in 2,539 cases (41.8%) and the genitourinary system in 961 cases (15.8%), of which hypospadias was seen in 257 (11.5%), of which 87 (34.0%) had a meatus on the penile shaft, 44 (17.2%) at the penoscrotal junction, 40 (15.6%) at the level of the scrotum, while the others were coronal 16 (6.3%), perineal 8 (3.1%), glanular 8 (3.1%), and 53 (20.7%) were not specified. Of the 2,539 gastrointestinal surgical conditions, anorectal malformations, seen in 243 cases (9.6%) - 138 (56.8%) were females and 105 (43.2%) males; imperforate anus with a rectovestibular fistula was the commonest [106 cases (43.8%)]. Other common gastrointestinal disorders included hernia, intestinal obstruction, intussusception, swallowed foreign bodies, infantile hypertrophic pyloric stenosis and Hirschsprung's disease.

### ***Resource Limitations***

#### ***Theatres***

The Black Lion Hospital has a large theatre complex, with a theatre area devoted to laparoscopic procedures and another to extracorporeal lithotripsy. The scrub sinks have inadequate plumbing, many of the lights do not work – including all the ceiling lights in the theatre in which we worked, the instruments are of poor quality, with no Paediatric cystoscope available apart from the equipment taken to Addis Ababa by the Kind Cuts team. Also, the sterilising unit was not functioning during our visit, and Radiological procedures were made more difficult because of the lack of an image intensifier in theatre.

## **Anaesthetic Report**

The following are points to be highlighted on the anaesthetic component of the visit:

1. An inventory and *local* permission is needed to import the equipment.
2. Collaborative and careful inventory preparation is required.
3. Prior authorisation to commence work immediately essential.
4. Independent communication with local anaesthesia providers prior to trip to engage senior medical anaesthetic staff (of which there are only four!), perhaps via World Federation of Society of Anaesthetists, which have an Ethiopian branch.
5. Equipment upgrades needs to matched infrastructure and maintenance. In truth, plumbers would be more useful than medical staff.
6. Fundamentals remain a priority in teaching; caudals are hard to sell when there is little appreciation for local analgesia.
7. Nurse anaesthetists were very receptive to teaching.
8. Donated anaesthetic equipment filled genuine need.

## **Anaesthetic Clinic Assessments**

Of the 35 cases, including 1 ward patient and 2 new non-clinic cases, high risk candidates identified with issues including: Lower respiratory tract infections, malnutrition and failure to thrive (4.5 yo boy weighing 12 kg or another boy 6kg at 14months), cardiac defects (marked mitral regurgitation with globular heart on Xray, large VSD with bidirectional shunting and pulmonary hypertension), Trisomy 21 with VSD and diplegic CP, impending renal failure secondary to obstruction.

## **Teaching**

1. Caudal theory and practice
2. Laryngeal mask theory and practice
3. Penile block
4. Importance of thermoregulation
5. Gentle paediatric handling
6. Value of peri-operative analgesia
7. Anaesthetic circuit flow mechanics and respiratory physiology
8. Paediatric intravenous fluid physiology
9. Feeding and fasting in the peri-operative period
10. Precautions with congenital heart disease and VSD/ASD's
11. Pharmacology: Intravenous induction agents including Propofol, muscle relaxants, reversal, local anaesthetic safe dosing, blind saphenous vein access in infants.

### ***Anaesthetic Equipment Donations***

1. Laryngeal Mask airways : more than 40 recycled paediatric and adult LMA were collected from Western Health campuses.
2. Laerdal Self inflating bag and T-Piece anaesthetic circuit: recycled from Western Health.
3. Local Anaesthetics: 10 x 200ml Ropivacaine 0.2% - from Astra Zeneca.
4. 2x Pulse oximeters and automated BP: Graykon Scientific and personal.
5. IV giving sets with blood filters: 50 from Western Private. Very well received, in short local supply and essential with whole blood transfusion used in Ethiopia.
6. IV cannula: 3 boxes of 24G, 22G and 20G.
7. Textbooks: Oxford Handbook of Anaesthesia, Oxford Handbook of Paediatric Anaesthesia, RCH Drug Doses Guidelines (Personal).
8. Sterile anaesthetic trays: 30 from Western Private used for caudals.
9. TrueSat Pulse oximeter loaned by GE Healthcare.

### ***Surgical Teaching Sessions***

The clinical teaching sessions were similar to those of the visit in January, but directed to the new trainees and students who participated in the program: the standard of the student and registrar knowledge being most notable. The topics in surgery 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. Feminizing genitoplasty
7. Intersex diagnosis and management
8. COPUM management
9. Tumour management
10. Percutaneous access
11. Resuscitation of pyloric stenosis
12. Use of subcuticular sutures
13. Hypospadias repair – Ulaanbataar
14. Horse-shoe management
15. Caudal anaesthesia
16. Hirschsprung's radiological diagnosis
17. Choledochal cysts Ix and Mx
18. Hip dysplasia
19. Radiation safety
20. Bowel obstruction
21. Sharps management
22. Operative field counting
23. Inventory management

## *Consultations*

The initial consultations were conducted during a ward round on the day of arrival, followed by an outpatient session the following day with a total of 59 patients undergoing specific review, adding to the 84 patients seen by the Kind Cuts for Kids team in January 2008. Many other patients were briefly discussed, but not directly managed.

One patient each with: renal dysplasia and vesicoureteric reflux, traumatic urethral stricture, failed circumcision, penile dermoid, inflammatory pseudotumour, craniopharyngioma, abdominal mass, There were an number of conditions that affected more than one patient: COPUM 10, bladder exstrophy 7, anorectal anomaly – 7, hypospadias – 7, Hirschsprung’s – 3, labial adhesions, intersex – 3, urolithiasis - 2, neuropathic bladder - 2, vomiting – 2, bladder instability – 2.



Dr Bramley examines the chest of a boy during the outpatient visit, prior to admission for surgery.

## *Surgical Anaesthesia*

A total of 23 anaesthetics were administered, which included the addition of regional anaesthesia, consisting of 12 caudal anaesthetics, 2 of which were administered by the visiting anaesthetist, followed by 3 with which he assisted and 7 that were performed unassisted, including 4 during which the student of an earlier procedure became the teacher of one of the other local practitioners. Two patients had a lumbar epidural and one had a penile block. It was noted that the ward was not able run an infusion for the epidural, and appropriate care was taken in the management of these cases.

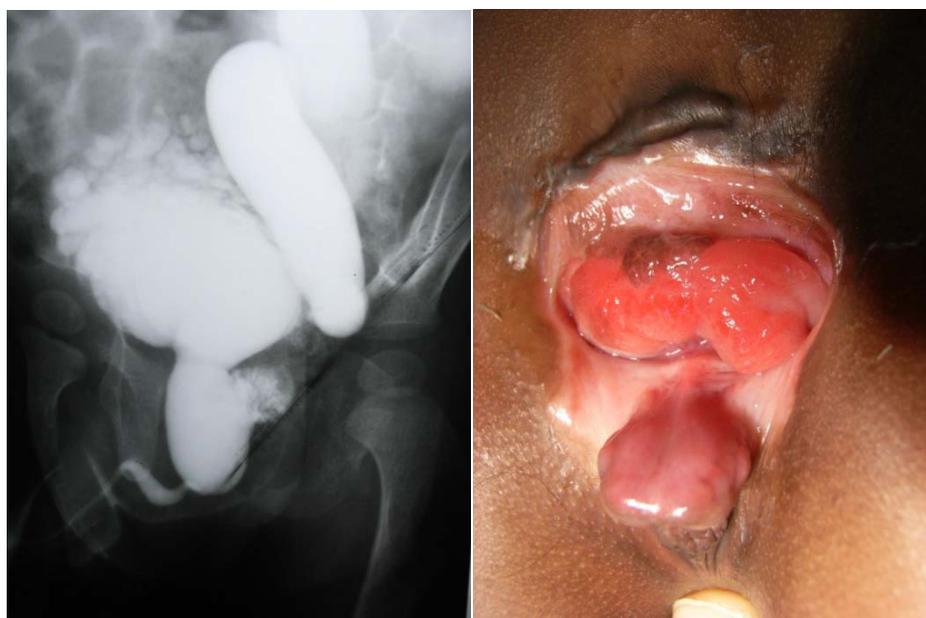
Eleven children had their anaesthetic administered through a laryngeal mask.

## Operative Surgery

Sixty-eight operations were performed on 27 patients who had surgery principally on major urological anomalies, particularly on boys with urethral obstruction or hypospadias, and bladder exstrophy and anorectal anomaly children. This brings the total for the year to 148 operations on 58 patients during two visits. More than one of the following procedures was performed:

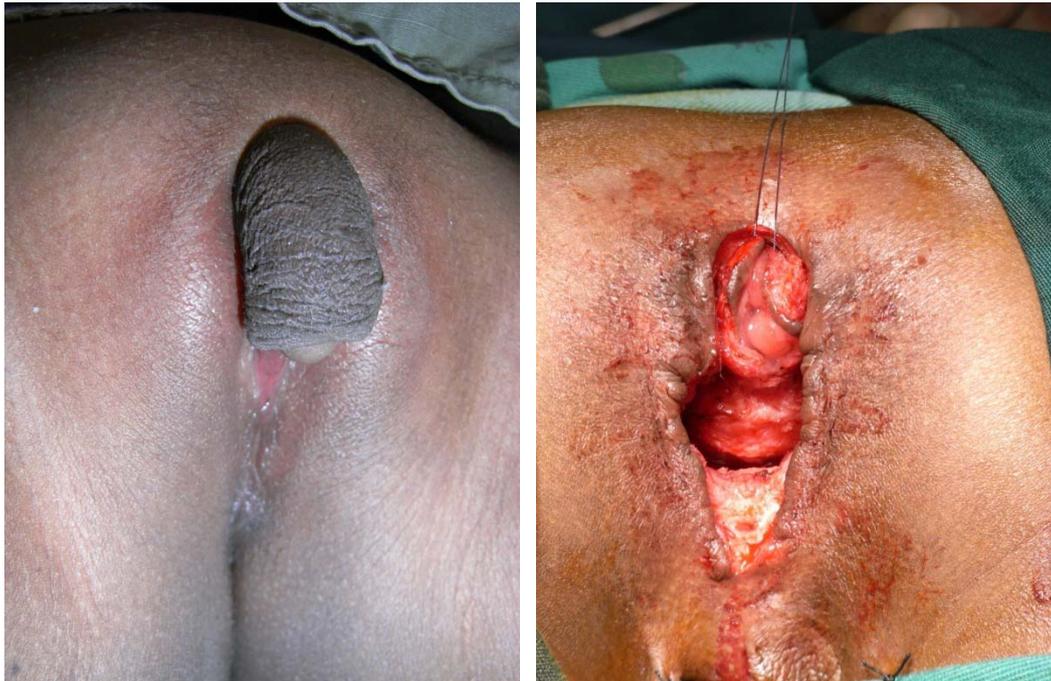
COPUM fulguration	3
Cystoscopy	7
Vesicoscopy	3
Bladder biopsy	2
Urethral dilatation	2
Osteotomies - bilateral anterior	2
Osteotomies - bilateral posterior	2
Bladder exstrophy closure	2
Epispadias repair	3
Perineoplasty	2
Omphaloplasty	3
Hypospadias surgery	8
Vaginoplasty	2
Pena surgery	4
Inguinal herniotomy	4
Laparotomy	2

One patient had each of the following: laparoscopy, clitoroplasty, Wolf graft, cystolithotomy, excision of lipomatous tail, colonic resection, colostomy revision, Ileocaecocystoplasty, Mitrofanoff, Wilms' nephrectomy, pyelolithotomy, scrotoplasty, SP catheter insertion or excision of penile sinus.



The two main conditions treated during the two visits of the Kind cuts for Kids Foundation to Ethiopia in 2009 have been urethral obstruction (left radiograph) and bladder exstrophy (right).

## Operative Cases



Surgical cases included a girl (left) with a congenital anomaly of her hormone metabolism, and the boy on the right who was born with an imperforate anus. The operative photo shows the early phase of the repositioning of his anus and pelvic muscle to enable normal continence.



The boy (left) was born with bladder exstrophy, treated by having his urine diverted into his bowel. Unfortunately, he became incontinent of watery faeces. His surgery involved the formation of a continent new bladder. The girl (right) presented with an abdominal mass, due to a kidney tumour, which was successfully removed.

## *Radiology Report*

The Radiology Department lacks much of the equipment required to provide an Australian standard of service, but has been fortunate to recently purchase a new CT scanner. Otherwise, there is inadequate and poorly functioning equipment and, for such a large hospital, a limited number of consultant Radiologists (6).

Current medical school training facilities in Addis are the Addis Ababa Medical Faculty, the Gonder Medical School and the Jema Medical School, the latter two are recent additions. Approx. 80% of the medical graduates are trained outside of Ethiopia in Cuba, Russia, Hungary, i.e communist countries, and, previously, the old E.Germany. They get free scholarships from these countries including money for maintenance.

## *Recommendations*

### *Theatres and Surgery*

1. Within the constraints of finances and manpower, more Paediatric Surgical services and Anaesthetic should be provided in Ethiopia.
2. The Black Lion Hospital and Addis Ababa University should further develop Paediatric Surgical and resuscitation teaching of resident and medical students.
3. Assistance should be sort for improved Paediatric endoscopic and other surgical and Anaesthetic equipment.
4. 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 special, in association with the College of Surgeons of Central and East Africa.
5. Community awareness of surgical disease in children should be enhanced. Anticholinergic medication (Oxybutinin and Probanthine) should be made more readily available for the management of bladder instability and the neuropathic bladder.
6. Analgesics should be purchased in country and not taken with the visiting team.



The Anaesthetic and surgical collaboration is indicated by senior surgical staff being prepared to learn caudal anaesthesia from Dr Bramley (left).

### **Anaesthesia**

7. Reinforcing fundamental points of care :
  - a. *Hygiene* e.g. reusing syringes, no airway filters, hand washing, rubbish everywhere.
  - 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.
  
8. 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* –although this is not as simple as it seems in this environment; patient selection is complex, pharmacological differences make it less attractive, no recovery area, poor suction in the event of reflux.
  - c. Shift to *propofol* based induction.
  - d. Discouraging *inappropriate use of Suxamethonium*.
  
9. What the local were most interested in:
  - a. Concise reference material (Oxford Handbook of Anaesthesia/Paediatric Anaesthesia, RCH Drug Dose Guidelines).
  - b. Computer based reference material e.g. documents, power point presentations, literature that could be transferred to USB's.
  - c. Pictorial in-theatre education opportunities from the laptop.
  - d. New techniques and drugs.

### **Other Recommendations**

10. Protective eye-wear are an essential item of equipment and donation.
11. Oral analgesics should be purchased in Ethiopia, not taken as excess baggage.
12. Toys and other non-essential equipment should be vetted by the Foundation Board and the senior staff in Addis Ababa.
13. Funds should be sort for in country cystoscopes.

### **Radiology**

Ideally there would be a replacement of all three ultrasound machines that have both pulsed and colour doppler facilities, are able to print images, with adequate Paediatric, transvaginal and adults probes. The image intensifier in the Department should be replaced with one that has digital fluoroscopy capabilities, and a similar unit should be obtained for the theatre complex. Obviously, the CT that has not functioned for 4 years should be replaced. The US and plain film facilities should be sorted before the introduction of high end, high maintenance MRI equipment.

Subspecialties of paediatric and interventional radiology need to be developed with separate lists, training and research facilities, such as the library.

## *The Sponsors*

The visit to Ethiopia has again been supported by the Ministry of Health in Ethiopia, donations to the Kind Cuts for Kids Foundation from the Rotary Clubs of Manningham and Preston, and the Society for Children Inoperable in Mauritius, plus support from the Qantas airline.

Several donors provided donations-in-kind, including the John Fawcner Hospital (disposable gloves + surgical masks), Johnson and Johnson (sutures), Tyco (sutures), Conmed Linvatec (diathermy handles + needle points), Ansell (sterile gloves), Clifford Hallan, Astra Zeneca (local anaesthetic).



The donation of equipment is an important part of the Kind cuts for Kids Foundation being successful in delivering service and teaching to developing countries. The red “suture boxes”, organised by the Manningham Rotary Club, have been a highly productive initiative.

