UNIVERSITY OF ILORIN

THE ONE HUNDRED AND SEVENTY-NINTH (179TH)
INAUGURAL LECTURE

"OF MONSTROSITIES IN CHILDREN…"

By

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Courtesies
The Vice-Chancellor, sir,
Principal Officers of the University,
Deans and Heads of Departments,
Professors and Members of Senate,
My Lords Spiritual and Temporal,
Gentlemen of the Fourth Estate of the Realm,
Distinguished Invited Guests,
Great students of the University of Ilorin,
Ladies and Gentlemen.

Introduction

I thank the Almighty God, the creator of the universe, for preserving all of us to see today. I also want to thank you sir, Mr. Vice Chancellor, for giving me the opportunity to deliver this inaugural lecture.

Two lecturers in the Department of Surgery, University of Ilorin, have previously delivered their inaugural lectures. They are:

1. Prof. Babatunde Agaja, an Orthopaedic Surgeon, on July 15th 2010
2. Prof. Ismaeil Adigun-Lawal, a Plastic Surgeon on April 7th 2013.

This will be the first inaugural lecture to be delivered by a Paediatric Surgeon from the University of Ilorin.

As far as I know, only four other Paediatric Surgeons in Nigeria have given inaugural lectures. Their names, dates and topics are listed below:

1. Prof . M. A. Bankole, Obafemi Awolowo University, Ile Ife, (1992) on "The Dilemma of the Academic Surgeon"
2. Prof. Sanya Adejuyigbe, Obafemi Awolowo University, Ile Ife, (2006) on " That they may have life --"
3. Prof. Shonubi , Ogun State University, Shagamu (2015) "Children, redressing natures

4. Prof. Sebastian Ekenze, University of Nigeria, Nsukka, (2017) on "Newborn surgery in a developing world: dissecting the gains, challenges and advances"

Let us have an overview of Paediatric Surgery, then look at these diseases that have been a burden not only to these wonderful children, but to the surgeons who have been looking after them, and their doting parents.

What is Paediatric Surgery?

Paediatrics is management of diseases in children from birth through adolescence to 15 years. Surgery is treatment of diseases, injury or deformity by physical operation or manipulation. Paediatric Surgery is, therefore, surgical management of children from birth to age of 15 years.

Paediatric Surgery is different form adult surgery because the physiology and some of the range of diseases of children are different from adults. Many children do not understand our language, will not co-operate during our management, and their reactions are unpredictable (Gupta 2014). This makes the work of Paediatric Surgeons very difficult.

Scope of Paediatric Surgery

Past inaugural lecturers gave us some insight in the history of surgery (Agaja 2010). Although there were different beliefs about causes and management of diseases in different cultures, Hippocrates was generally credited for adding science to medicine. He was born around 450 BC in Greece and taught that most diseases had natural causes and proffered solutions to each disease which he accurately documented. In Renaissance Europe anatomy and physiology were studied extensively. This lead to two types of physicians, one whose main thrust of cure was by herbs, drugs and diet, and the other, dedicated to treatment of injuries and deformities by manipulations and use of instruments. These latter were called barbers. Perhaps the most famous of

these early surgeons was Ambroise Pare, a 16th century French Surgeon who gave five reasons for performing surgery:

1. To eliminate that which is superfluous
2. To restore that which has dislocated
3. To separate that which has been united
4. To join that which has been disjointed
5. To repair that which has been defective by nature.

Pare's last indication is important as it refers to children born with several anomalies. Added to this indication will be infections (especially in developing countries) trauma and tumours (cancers).

Evolution of Paediatric Surgery

World

Egyptian graffiti drawings dating back to 3000 BC depicted circumcision. Indian Shushruta (5th century BC) described operations on head and extremities of children, with drawings of about 120 surgical instruments (Gupta 2014). Hippocrates (460-370BC) described management of head injuries and limb fractures in children.

Early in the nineteenth century interest grew for management of children with hospitals dedicated to their care. *Hospital des infant maladies* was established in Paris in 1802, and Great Ormond Street Hospital for Children in London in 1852. Boston Children Hospital in America opened in 1882. Although these hospitals were dedicated to children, most surgeons still practised Paediatric Surgery on part-time basis, as more money could be made outside the hospital in other specialties like Orthopaedics.

Modern-day Paediatric Surgery started from the works of William Ladd in Boston Children Hospital who trained Robert Gross; and Sir Dennis Browne in London. Because of their excellent work, young doctors from all over the world went to

them for training in Paediatric Surgery. William Ladd (Fig. 1) is regarded as the father of modern-day Paediatric Surgery.

Fig.1. William Ladd (1778-1841)

Development of Paediatric Surgery in Nigeria

As in many countries in Africa, general surgeons interested in Paediatric Surgery added the burden to their workload. In 1968, Prof. Bankole finished his Paediatric Surgery training in Columbus, Ohio, and joined University College Hospital, Ibadan, as the first properly trained Paediatric Surgeon. He later transferred his services to Obafemi Awolowo University, Ile Ife to start training residents in Paediatric Surgery. Several other Paediatric Surgeons who trained outside Nigeria, started Paediatric Surgical practice in Nigerian Hospitals. Notable among them were Prof. Momoh in Zaria, Prof. Adeyemi in Lagos, Prof. Nwako in Enugu. They also started training Paediatric Surgery residents in their teaching hospitals. Prof. Momoh trained Prof. Nmadu who trained Prof. Ameh. Prof. Bankole trained Prof. Adejuyigbe who trained Prof. Sowande, Prof. Adeyemi trained Prof. Bode, etc. Thus Paediatric Surgery training initially started

from Universities of Lagos, Enugu, Ife and Zaria where residents graduated as fully trained Paediatric Surgeons.

Development of Association of Paediatric Surgeons of Nigeria (APSON)

In 1991, Prof. Bankole, Prof Debo Adeyemi and others made a decision to form the Association of Paediatric Surgeons of Nigeria (APSON). The inaugural meeting of APSON was held on 31st January 1992 in the Department of Surgery, Lagos University Teaching Hospital. Thereafter, the association met a few times usually during the meetings of the West African College of Surgeons in Ibadan. It attempted to compile a list of Paediatric Surgeons in Nigeria and to draw a constitution. However, efforts were not sustained and the association became dormant. In September 2001, the first scientific meeting of APSON held in Lagos. It was meant to be an international update programme initiated by Dr. Odelola in collaboration with Staff Practitioners in Children's Hospital, Oakland, California. The American team could not come because of the tragedy of September 11, 2001. The scientific programme, however, went ahead, attended by about 20 Paediatric Surgeons all over Nigeria. A general meeting was held and the first APSON officers elected, with Prof. Nene Obianyo, from Enugu, as the President. APSON has since had 13 annual general meetings and scientific conferences. The 2010 conference was held in Ilorin, the last in Enugu in September 2017. The past presidents of APSON are:

Prof. Nene Agugua-Obianyo	2001 to 2006
Prof. Olusanya Adejuyigbe	2006 to 2010
Prof. I. Evbuomvan	2010 to 2014
Prof. James Adeniran	2014 to date

I am currently the National President, with about 100 members nation -wide.

Paediatric Surgery in Ilorin

As in many centres in the world, Paediatric Surgery was initially practised by adult surgeons as part of their clinical work. Notable among these were Prof. Odaibo, Prof. E. O. Odelowo and late Dr. A. T. Duze, then later by Dr. I. O. Olaoye, Dr.M. D. Adesina, Dr. J. Megwa and Dr. (now Prof.) G. Rahman. Prof. G. Rahman took a special interest and was my main reference-man when I arrived in 1999.

I started Paediatric Surgery as a separate unit from adult surgery in 1999 and started training residents virtually right away. Dr. (now Prof.) Auwal Abubakar, joined me as second consultant in 2000, but left for University of Maiduguri in 2002. With him we got full accreditations of both the Nigeria Postgraduate Medical College and the West African College of Surgeons to train Paediatric Surgeons. Dr. Lukman Abdur-Rahman joined in 2005 and Dr. Adegoke Nasir in 2008. Since 1999 I have trained about 8 Paediatric Surgeons, 1 of them a professor.

Scope of Paediatric Surgery in Ilorin from 2000 to 2017

From a modest number of about 200 operations in 2000, we now perform more than 500 operations annually in the unit. (Table. 1)

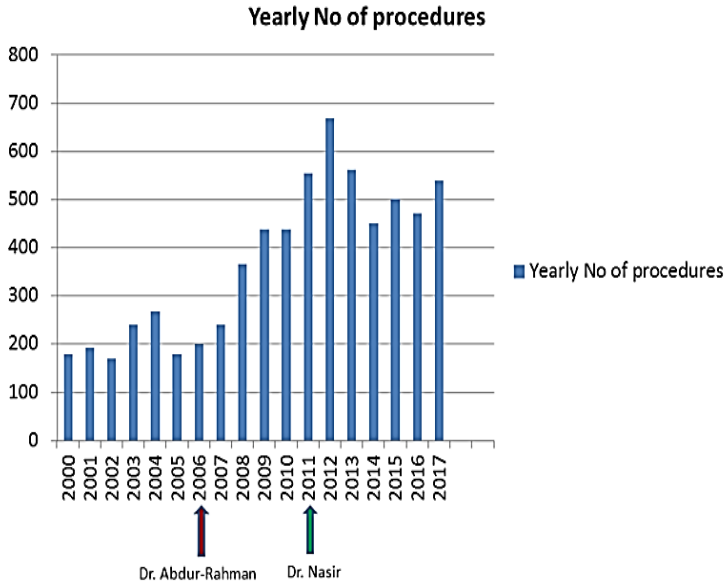

Table 1. Operations performed yearly in Paediatric Surgery Unit (2000-2017)

My contributions to Paediatric surgery

1. TYPHOID ILEAL PERFORATION

The pathology of salmonellosis after a faeco-oral transmission has been described in1994 by Grange. Typhoid enteric fever has continued to be a public health problem in many developing countries where clean portable water is not available, and disposal of waste is inappropriate. About 21 million typhoid cases are seen yearly all over the world with deaths as high as 2 million yearly. 50% of cases of typhoid intestinal perforations occur in children.

Salmonella species are named after Elder Salmon (Fig. 2). He trained as a veterinary doctor but made immense contributions to the agricultural sector in United States

Fig. 2. Damon Elder Salmon 1850--1914

Salmonella Species are gram-negative rods (Fig. 3) that thrive in places where waste disposal is inappropriate and man comes in contact with the organisms.

Fig. 3. Salmonella Species

These organisms multiply rapidly in the gut, pass through liver and are excreted in the bile, and then rapidly proliferate in the lymphoid follicles of the distal ileum (Peyer's patches). These organisms may cause a hole in the anti-mesenteric border of the terminal ileum where faeces can leak into, and cause inflammation of the lining of the abdomen (peritonitis) and turn an otherwise normal child to a 'monster'. Fig. 4 shows a patient with typhoid ileal perforation being prepared for operation.

Fig. 4. Patient with typhoid ileal perforation (monster ?)

Untreated, this condition may lead to generalised infection (septicaemia), multiple organ failure and death.

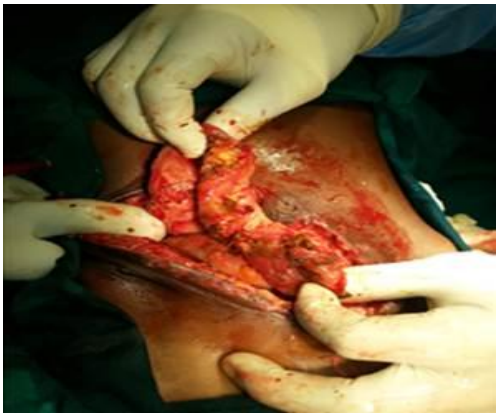

Fig.5. Intra-operative picture showing multiple perforations of ileum

Typhoid ileal perforation is the commonest emergency operation we operate on in children above four years, operating on the average 30-40 patients every year (Table 2).

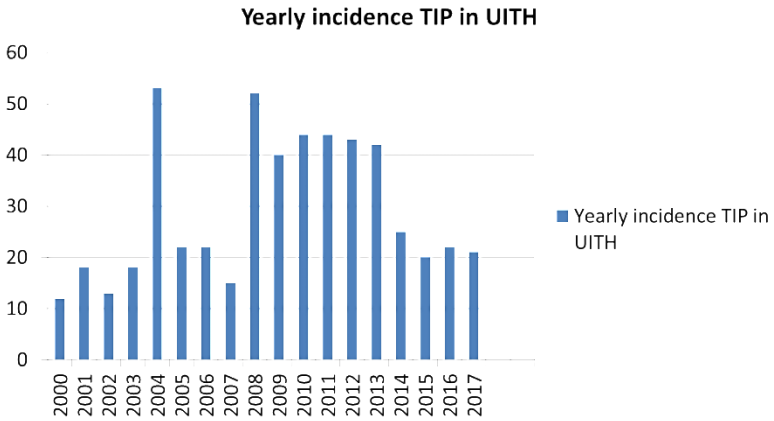

Table 2. Yearly incidence of typhoid intestinal perforation in UITH, Ilorin

My contributions to reducing death rate (mortality) in patients with typhoid ileal perforations:

a. Making early diagnosis ---the "Olaniyi Adeniran's sign"

From a review by Rahman, Johnson and Adeniran (2001), mortality in small children with typhoid could be as high as 50% because of late diagnosis. We must also note that children will not cooperate with clinicians especially when they are in severe pains.

Adeniran (2006) described the "Olaniyi Adeniran's sign" for easy diagnosis of peritonitis in children. This is, essentially, a single-finger test to elicit rebound tenderness at the umbilicus.

b. Limiting investigations during pre-operative work-up

Typhoid depresses bone marrow, therefore packed cell volume to determine level of anaemia, and blood cross match are necessary before operation, so also the estimation of urea and electrolytes as it is desirable to correct potassium when paralyzing drugs may be used at operation. Apart from these, Adeniran (2016) said erect abdominal X-rays looking for air under the diaphgram, or abdominal ultrasound looking for pelvic collection are unnecessary. These delay operation, and also waste parent's scarce resources.

c. Saving very ill patients from excessive use of drugs during anaesthesia

A lot of patients with typhoid ileal perforation presented very late. Many of them ended in Intensive Care Unit because of difficulty in breathing after operations. Adeniran (2008) noticed the difficulty in breathing was due to a drug called 'pancuronium' which was used to paralyze them during operations. Adeniran and Taiwo (2008) advised anaesthetists to be selective or reduce the dosage of paralyzing drugs during anaesthesia. Initial local skin infiltration, supplemented with ketamine, were used successfully for anaesthesia in many patients.

d. Advise on incision for exploratory laparotomy

Adeniran (2009) advised that transverse supra-umbilical incision (Fig. 6) is better for exploring children with peritonitis as this provides a complete access to the peritonem. Sometimes empyema of gall bladder may complicate typhoid, and cholecystectomy may be done from this approach.

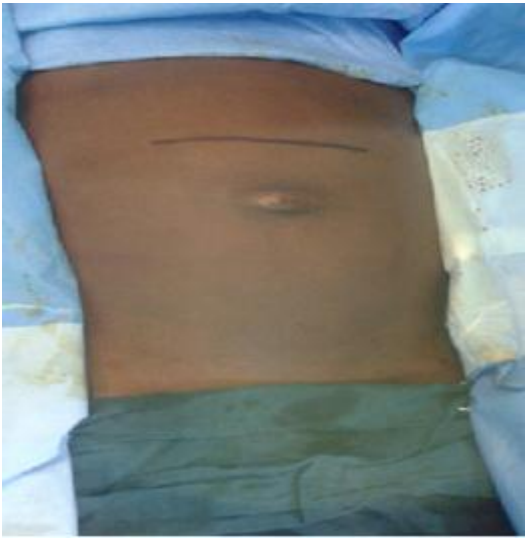

Fig. 6. Use of transverse, supra-umbilical incision for laparotomy

e. Complete review of steps of the operations

Adeniran (2016) at the Pan-African Paediatric Surgery Association conference in Lagos, completely revised the operative techniques to Paediatric Surgeons all over Africa.

f. **Management of patients with major post-operative complications.** Surgical site infection is the commonest postoperative complication. This is easily managed by regular dressing and oral antibiotics. The other major complication, which has led to several deaths is faecal fistula (Irabor 2003).

Adeniran and Taiwo (2006) described how to manage these patients.

g. Management of patients with multiple perforations

Adeniran, Taiwo and Abdur-Rahman (2005), Adeniran, Odi and Nasir (2008) saw patients with 14, 27 and 32 intestinal perforations. All survived. We proved that, with proper management, number of perforations had no effect on prognosis. A nine-year old girl with 32 perforations had the highest no of typhoid intestinal perforations in published literature. She was managed in UITH in 2006 during the Greek Olympics. At discharge, the nurses gave her an Olympic bouquet of flowers, and for her Olympic medal, Adeniran gave her the surgical knife (Fig. 7).

Fig 7. Nine year old girl with 32 perforations from typhoid intestinal disease

h. Adeniran, Nasir et al (2011) identified faecal fistula as the only predictor of mortality

From my research over the years, Adeniran has reduced the peri-operative mortality from about 24% Rahman and Adeniran (2001), to less than 5%, Adeniran , Abdur-Rahman,

Nasir (2007,2011,2017)- the lowest mortality rate of any published data in Africa (Table 3)

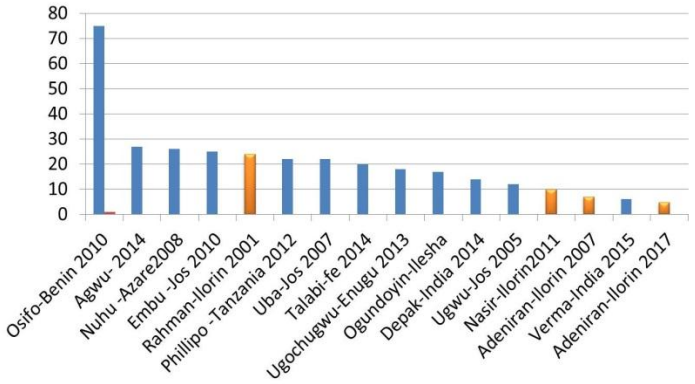

Table 3. Mortality rates in typhoid perforation in published papers (2001-2017)

2. FAECAL FISTULA

One of the commonest major complications after operation on the intestine is faecal fistula (Fig. 8). This is a condition when there is communication between the lumen of the intestine and skin.

Fig. 8. Faecal Fistula

The fistula leads to rapid loss of body fluids, electrolytes and nutrition. This effect is more pronounced in children who may rapidly lose weight and may die. Re-operations to primarily close the faecal fistula are usually unsuccessful because of on-going generalised infections. The children turn to '**monsters'**. Adeniran and Taiwo (2006, 2008) proposed that patients with faecal fistula should be divided into 2 groups: high-output, and low-output faecal fistula. Their characteristics are shown in Table 4.

FAECAL FISTULA

LOW-OUTPUT	HIGH OUTPUT
1. dressing with small gauze	1. dressing with large gauze
2. dressing 1-2 X per day	2. dressing 4-6X per day (PRN)
3. effluent semi-solid	3. effluent fluid and copious
4. patient still passing faeces or gas per rectum	4. patient not passing faeces or gas per rectum
5. patient weight steady	5. patient rapidly losing weight

Table 4. Characteristics of faecal fistula

This distinction should be made within the first week of admission so that appropriate action should be instituted in patients with high-output fistula. Adeniran (2006) proposed that low-output faecal fistula can be managed non-operatively with regular dressing, antibiotics and high protein diet. Surgeons have attempted reoperation and closure of fistula in patients with high-output fistula. If the bowel can be completely rested and total parenteral nutrition instituted, re-anastomosis may be possible. But with gross contamination of the peritoneum, on-going sepsis in the patient, general malnutrition and decreased immunity,

especially in children, immediate re-operation is usually not successful.

Adeniran (2006) therefore, did the following in patients with high-output fistula, (Fig. 9):

a. the bowel was exteriorized
b. peritoneum was generously lavaged
c. two or three tension sutures were applied to the fascia
d. fascia was closed but skin left open
e. skin dressing commenced early with honey.

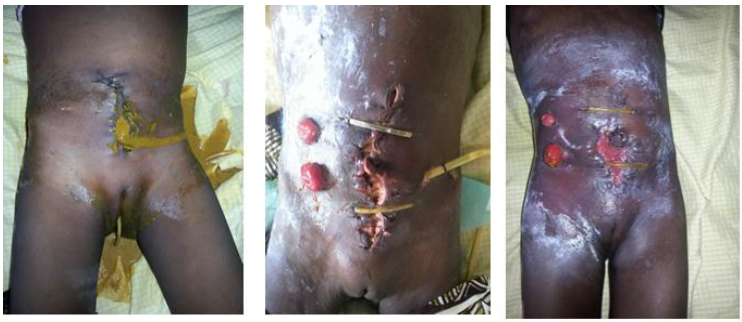

Fig. 9. Operative management of patients with high-output faecal fistula

By this approach, peritoneal contamination was contained, bowel activity returned within a few days, and patients returned early to normal oral feeding. 'Monsters' are rapidly turned to normal children again.

Adeniran (2006) advised that the divided stoma be placed near each other so that only a peri-stomal incision is necessary at take-down of the ileostomy.

3. USE OF TENSION(FREE) SUTURES IN CHILDREN

Tension sutures were popular when absorbable sutures were used to close abdominal wounds. When the peritoneum was contaminated, there were common cases of burst abdomen because the strength of the absorbable sutures was no more than a few days. When non-absorbable sutures became available, the incidence of these burst abdomen decreased. Adeniran noticed that poor nutrition, prolonged infection and inadequate antibiotics turned the children to **'monsters'** such that incidences of burst abdomen still occurred despite use of nylon sutures to close the abdominal wounds. Reoperations were sometimes also necessary due to faecal fistula, large intra-abdominal pus collection, and burst abdomen. In these cases Adeniran, Odi, Taiwo (2006, 2008) advised insertion of 2-3 tension sutures, as in Fig. 10, to support the fascia sutures for 10-15 days. These help to convert the **'monsters'** to early normal children.

Fig. 10.Use of tension (free) sutures after re-do operations

4. OMPHALOCELES

Omphaloceles—these are children who have some of their abdominal contents outside the body Fig. 11.

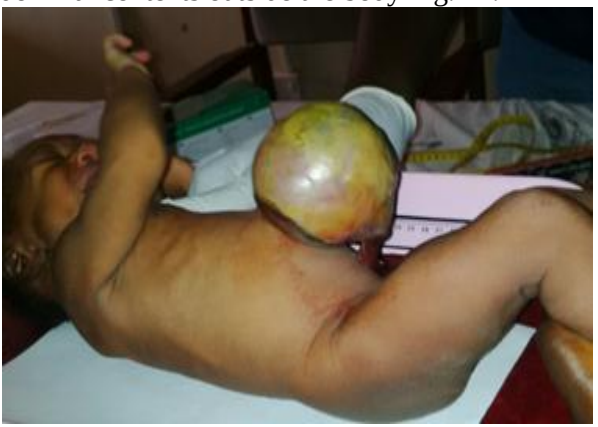

Fig. 11. Major omphalocele in a newborn

Development

At about the 4th week of intra-uterine life, the middle part of the intestine herniates into the base of the primitive umbilicus. This happens in all children. Two weeks later that same part of the intestine returns to the abdomen and rotates 270 degrees anticlockwise. What causes the movements of the intestine in and out of the abdomen are not entirely known. What is known is that this process is complete in most children. Unfortunately, the intestine comes out in some children and fails to return to the abdomen turning the children to '**monsters'**.

Presentation

There are two types of omphaloceles depending on the diameter of the umbilical defect: minor and major omphalocele. Their features are shown in Fig. 12.

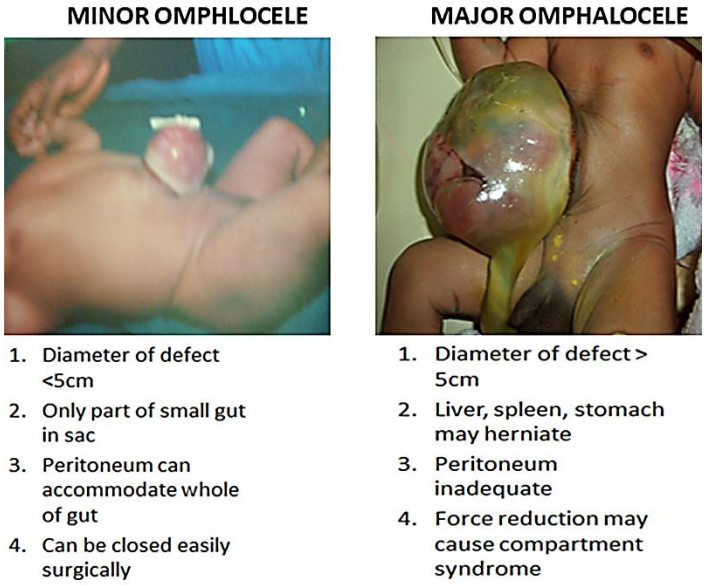

Fig. 12. Differences between 'minor' and 'major'omphaloceles.

In 'minor' omphalocele the diameter of the defect in the abdominal wall is less than 5cm. In these children, only the small intestine is in the sac, the capacity of the abdomen can accommodate the whole of the bowel, and there are usually no other major congenital anomalies. The abdominal defects in these children are easy to close surgically.

But in some children, the diameter of the defects is more than 5cm. These are called 'major' omphaloceles because other abdominal organs like liver, stomach, spleen, etc. may be in the sac and outside the body.

In major omphalocele the abdomen is too small to accommodate these organs that have herniated. If these organs are forcibly returned into the abdomen, three major problems will happen to the babies:

a. the diaphragm will be splinted and respiration compromised,

b. blood flow into the inferior vena cava will reduce which will lead to reduction of cardiac output,
c. blood to intestine will reduce leading to bowel gangrene.

In developed countries, these children are managed in three ways:

a. gradual reduction of the contents from a silo
b. elective ventilation,
c. parenteral nutrition.

As far as I know no hospital in Nigeria has adequate facilities for provision of silastic silo, or parenteral nutrition. Because of this, many centers manage them non-operatively with dressing and antibiotics. This results in a large ventral hernia which may be closed when the child is 3-4years old (Fig.13).

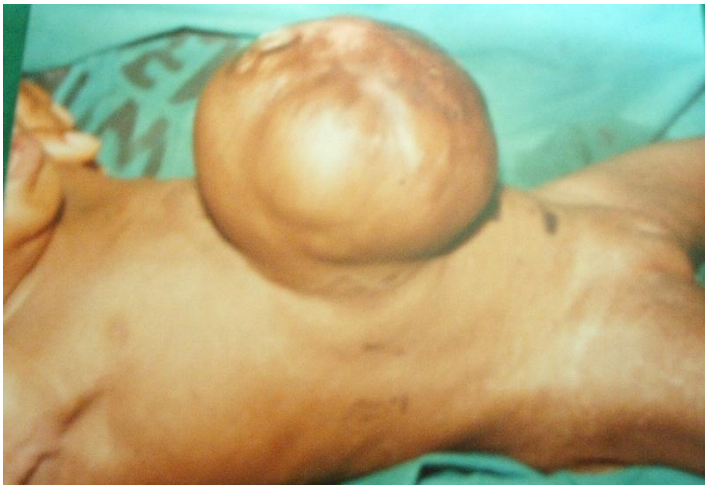

Fig. 13. Large ventral hernia: result of non-operative management of major omphalocele

Adeniran and Abdur-Rahman (2004) have shown that more than 50 % have infection or rupture of the sac or the parents discharge against medical advice because of need to look after

other members of family at home. Several centres in Nigeria have experimented with use of the infusion bag as substitute for silastic silos. These bags are easily infected and not found so suitable. The female condom may also be used.

My contribution to major omphaloceles--reclassification

Adeniran (2005) noticed a number of "major" omphalocele patients with the following characteristics:

a. diameter of abdominal defects more than 5cm
b. no other major congenital anomalies
c. the whole hernia can be completely reduced at the bedside without respiratory compromise to patient
d. there was plenty of skin and fascia for primary closure without tension .

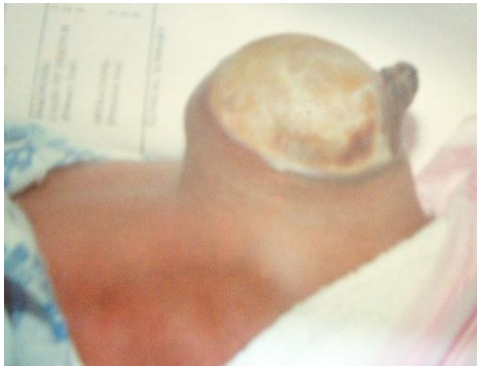

Fig. 14."intermediate" omphalocele

Adeniran (2005) proposed that this lot be called "intermediate" omphalocele (Fig.14). The advantage of Adeniran's classification is that many of the so called "major" omphaloceles who would be treated non-operatively with the above complications can now be managed operatively with quicker results, and shorter hospital stay.

Adeniran took this major re-classification of omphalocele to the World Congress of Paediatric Surgery in Delhi in 2010 with the poster presentation in Table 5.

SHOULD OMPHALOCELES BE RE-CLASSIFIED?

Adeniran JO, Abdur-Rahman LO, Nasir AA
•University of Ilorin and University of Ilorin Teaching Hospital,
•Ilorin, Nigeria

BACKGROUND
Omphaloceles are presently classified into 'minor' and 'major' categories depending on the diameter of the umbilical defect. In developed countries most 'major' cases are treated with silo, parenteral nutrition, progressive compression and elective ventilation. Most treatments are completed within 1-2wks[1,2]. In developing countries most cases are managed conservatively with honey dressing. This may take 3-4months for proper eschar to form. Even when successful, most patients don't come for secondary repair [3,4] .

OBJECTIVE
To re-classify omphaloceles into 'major', 'intermediate' and 'minor'.

PATIENTS AND METHODS.
All cases of omphalocele seen between 2002 to 2009 were retrospectively studied. Treatment given to patients with diameter of defects more than 5cm (major omphaloceles) were analysed.

RESULTS.
A total of 34 patients had diameter of defects more than 5cm. Mean age at presentation was 16.1hrs (range 1hr-48 hrs). Twelve were managed conservatively with sofra-tulle or honey dressing. Only 2 of these represented for ventral hernia repair. Omphaloceles of five patients ruptured during conservative management. They all had emergency operation but all died. Two patients discharged against medical advice because parents needed to look after other members of the family. Three of the 'major' cases were operated within 48 hours of admission. All died. The remaining 10 were well resuscitated, then operated between 3 to 15 days of admission. Only 2 died of sepsis (Table 1)

FIG 1. 'MAJOR' OMPHALOCELE WITH PLENTY OF FASCIA AND SKIN.

TABLE 1. EXPERIENCE WITH THE MANAGEMENT PROTOCOL IN 13 PATIENTS

S/N	Age (hrs)	Sex	Size	Length of Resuscitation	Outcome
1	17	M	8 X 6 cm	24 hrs	Died
2	24	M	8x8 cm	48 hrs	Died
3	7	M	6 X 4 cm	48 hrs	Died
4	1	M	6 X 4 cm	60 hrs	Alive
5	8	F	10 X 10 cm	60 hrs	Died
6	48	F	7 X 6 cm	3 days	Alive
7	8	F	8 X 8 cm	5 days	Alive
8	48	F	8 X 6 cm	6 days	Alive
9	22	M	8 X 5 cm	6 days	Died
10	14	F	8 X 6 cm	9 days	Alive
11	16	F	6 X 6 cm	11 days	Alive
12	3	M	9 X 7 cm	13 days	Alive
13	16	F	8 X 7 cm	10 days	Alive

"INTERMEDIATE" OMPHALOCELE

1. Diameter > 5cm
2. Contains mostly loops of bowel
3. Plenty of skin & fascia
4. No other major congenital anomalies
5. Can be manually reduced at bedside without respiratory embarrassment

DISCUSSION
In developing countries, silastic silo, parenteral nutrition and elective ventilation are not readily available, most of the major omphaloceles are therefore managed non-operatively. Many of the sacs become infected or rupture or the parents discharge against medical advice from prolonged hospital stay. We have noticed a group of these 'major' cases that have the following characteristics:
1. There is plenty of fascia and skin around the defect (Fig. 1)
2. The omphalocele can be reduced at bedside without respiratory embarrassment to the patient.
3. There are usually no other major congenital anomalies
If this group is properly resuscitated patients can be primarily closed safely. Fig 2.
WE PROPOSE THAT THIS GROUP BE CLASSIFIED 'INTERMEDIATE' OMPHALOCELE.

FIG. 2.POSTOPERATIVE PICTURE OF REPAIR OF "INTERMEDIATE" OMPHOLCELE

CONCLUSIONS
More than half of cases originally classified as 'major' have plenty of skin and fascia to be closed primarily if properly selected. This classification into 'INTERMEDIATE' helps to isolate this important group for primary closure.

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Table 5. Poster presentation for re-classification of omphaloceles.

5. HIRSCHSPRUNG'S DISEASE

The condition was initially described in 1886 by the famous Danish paediatrician, Harald Hirschsprung, at a conference in Berlin.

The disease is due to failure of neural crest cells to completely follow the vagus nerve to colonize the bowel. These cells are responsible for relaxation of bowel during peristalsis (food movement). When the cells are absent, the bowel cannot relax to allow food to pass, and there is functional obstruction.

These children present with irregular passage of stool, constipation on and off and failure to thrive, turning the children to 'monsters'.

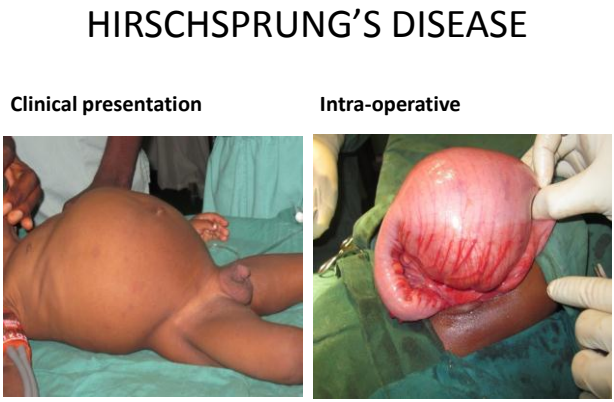


Fig.15. Children with Hirschsprung's diseases

Diagnosis

Once the diagnosis is made three basic definitive operations are sufficiently developed to manage the children. The first is to completely remove the part not colonised by the cells and bring the normal bowel down to the anus (Swenson's recto-sigmoidectomy). The second operation is to bring the normal bowel inside the abnormal bowel as a double sleeve (Soave operation).

My contribution to patients with Hirschsprung's Disease

The third major operation is by-passing the abnormal rectum by creating a tunnel behind the rectum. This operation was developed by Bernard Duhamel of France in 1956. This was the type of method I learnt during my Paediatric Surgical training in Britain in 1993. But to complete this operation a special

automatic stapling device (Fig. 15) is needed which was not available in Nigeria.

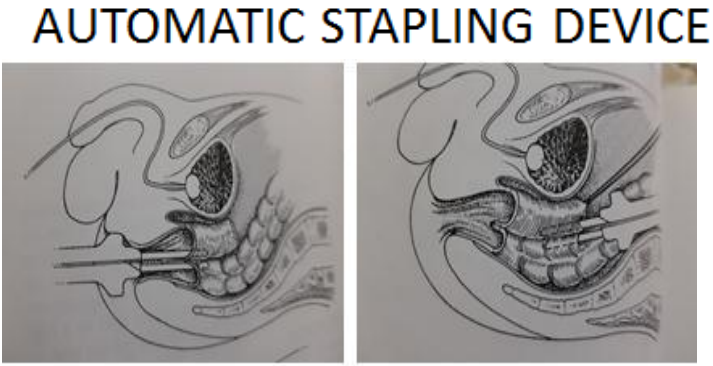


Fig. 16. Use of automated stapling devise to complete Duhamel operation

I, therefore, had to develop my own method of hand anastomosis to complete the operation. Adeniran, Abdur-Rahman, Taiwo and Odi (2011) developed a new technique of diamond anastomosis to complete the Duhamel Operation because the stapler was not available. Several patients were treated this way with very good results. Although the trans-anal pull-through is now in vogue, Adeniran's special method of diamond anastomosis may still be needed in patients with long-segment Hirschsprung's diseases in which an ileo-rectal Duhamel may be necessary with a Lester Martin's modification. By this operation the '**monsters'** are converted to normal children.

6. CLEFT LIP AND PALATE

Development of the face

The development of the face is complex. About the 5th week of gestation, fronto-nasal and maxillary processes appear. The median and two lateral processes of the fronto-nasal process

grow downwards to define the central lip, the palate, nasal orifices, the prolabium and the premaxilla (Fig. 17).

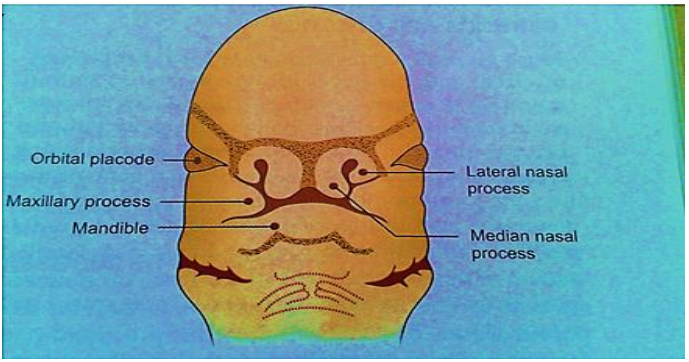


Fig. 17. Development of the face

The lateral maxillary process grows forwards and inwards to the maxilla. These processes fuse with surrounding mesoderm to form the upper jaw and primary palate. Palatine processes of each maxilla move inwards, adhere to each other and fuse to form the hard and soft palate. Failure of complete fusion of these structures lead to anomalies of the face, especially cleft lip and palate creating **'monsters'** (Fig. 18).

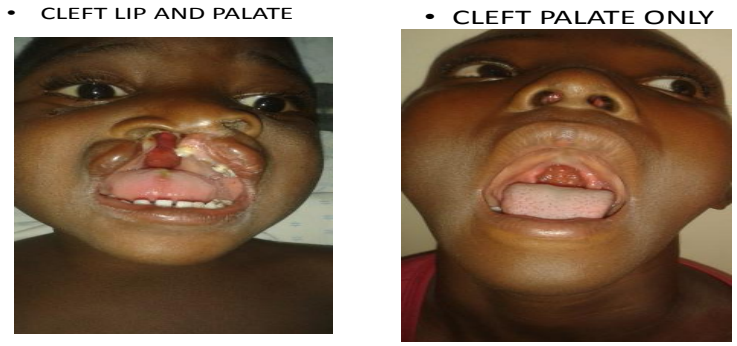


Fig. 18. Cleft lip and palate

Many families have deliberately abandoned such babies in the hospital or murdered them outright Adeniran and Adigun (2004). Adeniran, Nasir and Ajao have formed a Smile Train Team in Bowen Hospital Ogbomoso. The operations are sponsored by the Smile Train Inc. (an International Organization). Some of the operations we have done are shown in Fig. 19 and Fig. 20 in which the **'monsters'** were turned back to normal children.

Fig. 19. Cleft lip repair in a child

Fig. 20. Bilateral cleft repair

My experience with repair in clefts in adults

In 1952 an Indian surgeon, Ralph Millard, designed a simple operation to correct most of these anomalies. This operation, which may take less than 30 minutes, can produce a satisfactory result in many of these absurd anomalies in children. Adeniran& Adigun (2005) showed that the Millard operation also produced satisfactory repair in adults.

7. AMAZING SPORADIC CASES

a. Nine-year old Nupe Girl with burns

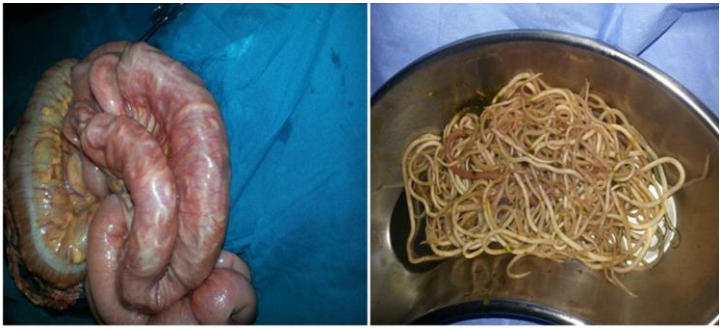
By evolution the recent man (homo sapiens sapiens) developed and harnessed fire in different forms for energy needs. But as Bob Marley said, your friend can also be your enemy. Fire either directly catching clothes, or from boiling water, can cause death or severely damage your body parts. A 9-year old Nupe girl was helping her mother in the kitchen when her clothes caught fire. She later presented in a private hospital for dressing for 10 months before coming to UITH. At presentation she had extensive contractures from the neck and right arm to the chest like a 'monster'(Fig. 21).

The main problem was getting to extend her neck so she could be put to sleep. I had to give some local anaesthesia to incise the scar in the neck before we can extend her neck, thanks to the dexterity of Dr. Kolawole, the anaesthetist !

Fig. 21. Nine-yr old with severe contractures following flame burns

b. Three-year old Otte boy

A 3-year old boy from Otte presented with 7-day history of abdominal pain and abdominal swelling for 4 days. On the day of admission he vomited one ascaris worm. Suspecting that he might have heavy worm infestation, we gave him antiworm orally. The second day he became irritable, his abdomen was getting tender, and we decided to operate on him. At operation his small bowel was completely obstructed with a huge ball of worms (Fig. 22). Loads of worms have turned him to a '**monster**'. Altogether, 63 worms were removed to open up his intestine.



Bowel obstructed by worms 63 worms extracted

Fig. 22. Worms obstructing the intestine

c. Girl with huge abdominal mass

A 10-year old girl presented with a huge abdominal mass and severe weight loss turning her into a 'monster'. Abdominal ultrasonography and CAT scan showed a huge tumour that may be either a neuroblastoma or a retroperitoneal sarcoma (Fig. 23). Both kidneys were free. Multiple biopsies showed inflammatory tissue only. We contemplated starting blind chemotherapy. I reluctantly agreed to an open biopsy after much discussion with Dr. Nasir.

Fig.23. Preoperative picture of 10-year old girl with abdominal mass

Several surgeons who reviewed her in theaters taught it will be an "open and close" case—meaning we may not be able to do much for the patient. When we prayerfully opened the patient, everybody was surprised to see a huge very mobile mass which we easily removed completely. The mass weighed 11kgs (Fig.24). I believed it was the power of prayers that gave us the courage to attempt a laparotomy in the first place.

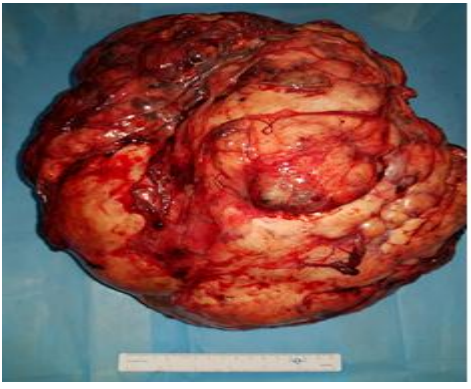


Fig.24—Eleven- kg mass removed from a 10-yr old 40-kg girl (by comparison, a 60-kg pregnant female-adult only carries a 3kg baby)

She presented in the clinic one month later having gained one kilogramme in weight (Fig. 25).

By this major operation, Mr. Vice chancellor, a '**monster**' has been converted to a normal girl.

Fig. 25. One month after mass removed from girl

8. CONJOINED TWINS

Several families are now blessed with live twins all over the world. Twins were welcome in Yoruba Tribe, where there are many folk songs in their praise, including a recommendation that they need to eat plenty of beans. This was not so in some parts of South Eastern Nigeria. They were thought to be '**monsters**' and therefore killed. That wonderful Scottish Nurse, Mary Slessor, came and saved many of them in Calabar. Identical twins are thought to derive from a single fertilized egg that splits to two. None-identical twins are usually from two separately-fertilized eggs. Many of the fertilized eggs separate completely to form identical twins. Some fertilized eggs may fail to separate completely at various levels leading to conjoined twins (Fig.26).

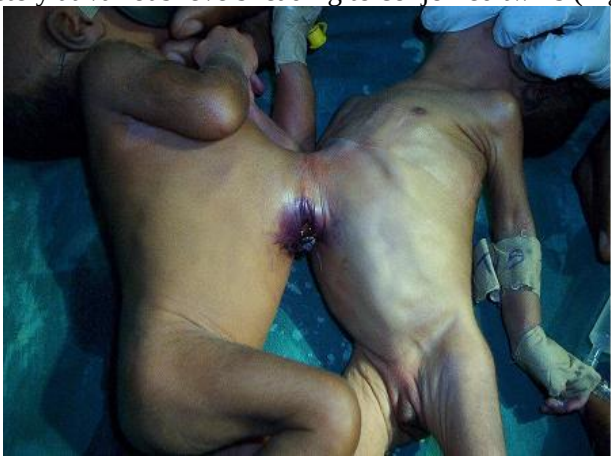


Fig. 26. Conjoined twins

I have noticed this incomplete separation also occurs in nature. Plantain pieces start as a bunch but separate as it grows. Sometimes the separation may be incomplete (Fig. 27).

PLANTAIN NOT FULLY SEPARATED

Fig. 27. Plantains not fully separated

Even more curious is when a twin fails to develop properly, and attaches itself outside to its twin as a parasite. There are only about 200 reports in the literature of a twin attached to its twin as an endo-parasite-the so called "fetus-in-fetu". Even rarer is a twin attached as a parasite outside another twin-the so called "fetus-ex-fetu".

"Fetus-ex-fetu" in Ilorin

A 43-year old, (with 5 previous pregnancies), woman was delivered through a prolonged vaginal delivery in a local clinic. Serial ultrasound during ante-natal care did not reveal anything untowards. The normal baby with another grossly abnormal attached baby was promptly referred to UITH as a 'monster'.

She was quickly prepared for operation. Thanks to the expertise of our paediatric anaesthetist Dr. Oyedepo, who was able to quickly anaethetised her. The parasite baby was surgically disconnected. The baby has remained healthy (Fig. 28). My. Vice Chancellor, sir, a **'monster'** has been converted to a normal baby.

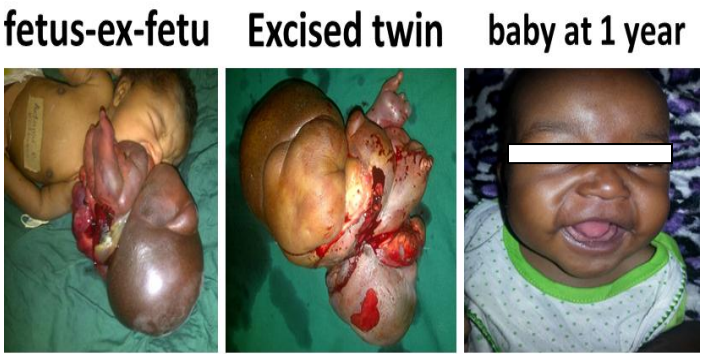


Fig. 28. Fetus-ex-fetu

10. "OLANIYI ADENIRAN'S SIGN"

I proposed the Olaniyi Adeniran's sign in early peritonitis in children.

This can also be referred to as the 'one-finger umbilicus rebound tenderness sign'. Adult patients with peritonitis are fairly easy to manage. They can give an accurate history of their problems and during examination, will tell you where the tenderness is at palpation. Doctors rely on parents to give the history of their children's problems which in many instances may not be accurate especially when such children are left with nannies. Children are usually very difficult to examine especially when acutely ill. This is because children:

1. do not understand our language
2. will not cooperate during clinical examination
3. have unpredictable emotional state especially during acute illnesses.

In examining the abdomen of an adult for acute inflammation (peritonitis) different areas of the abdomen are pressed in turn for tenderness. Rebound tenderness is elicited when the examining hand is rapidly withdrawn. Children will not cooperate to have serial areas of the abdomen examined.

Therefore a single finger at the umbilicus to elicit rebound tenderness demonstrates the 'Olaniyi Adeniran' sign.

Demostration of Adeniran's sign for generalized peritonitis.mp4

11. ANORECTAL MALFORMATIONS (IMPERFORATE ANUS)

Normal continence has rightly been called "God's greatest gift for mankind". In general, atresia of the rectum is more poorly handled than any other congenital anomaly of the newborn. A properly functioning rectum is an unappreciated gift of greatest price. The child who is unfortunate to be born with an imperforate anus may be saved from a lifetime of misery and social seclusion by the surgeon, who with skill, diligence and judgment performs the first operation on the malformed rectum (Gupta 2014).

Development of the anus

The exact mechanism of development of anorectum is still mysterious and controversial. Three different theories have been proposed:

1. conventional theory 2. theory of Chatterjee and Roy
2. theory of Van der Putte

For the purpose of this inaugural lecture, let us look at the conventional theory only. By the fourth week of foetal life, the alimentary tract has completely formed and differentiated into the foregut, the midgut and the hindgut, each having its own separate blood supply. The distal end of the hindgut enlarges to form the cloaca which is covered by the cloaca membrane.

Two weeks later, proliferation of mesenchyme forms a longitudinal urorectal septum (the Tourneux Fold) partially separates the cloaca into a posterior rectum and an anterior

bladder. Ingrowths from the sides (Rathke's plicae) complete the separation (Fig. 30). . Failure to complete this process converts these beautiful children to **'monsters'**.

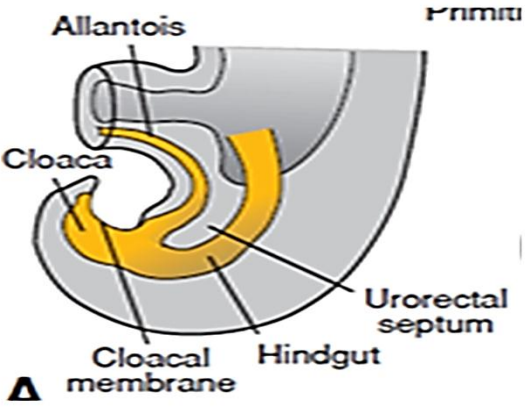


Fig. 30. Urorectal septum (Tourneux Fold)

Presentation of patients with imperforate anus
Males present differently from female
Adeniran and Adekanye (2003) found that in males (Fig. 31):

Fig.31. Male presentation with imperforate anus:

1. 90 % present in complete lower large bowel obstruction within the first 3 days of birth
2. The commonest anomaly is intermediate anomaly
3. The commonest fistula is recto-urethral bulbar
4. An invertogram or crosstable lateral X-ray is diserable for initial management

Adeniran (2003) found that in girls (Fig. 32)

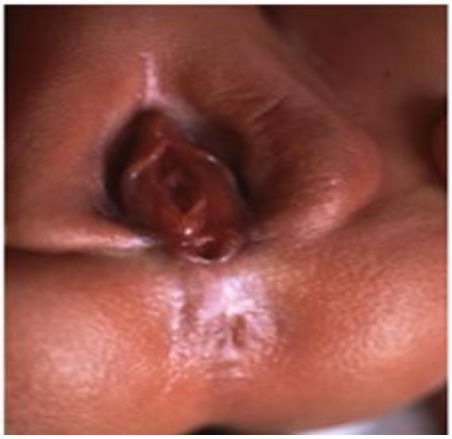


Fig. 32. Presentation in females

a. There is a decompressing recto vestibular fistula
b. Patients present late—after 1 month
c. Most anomalies are intermediate or low
d. High anomalies are very rare—usually cloaca anomalies
e. A fistulogram just before operation may help plan the operation.

Management of anorectal malformations requires an accurate clinical diagnosis, proper newborn treatment, meticulous anatomical reconstruction, and comprehensive postoperative care with the goal of having a child who is clean and dry with an excellent quality of life.

My contributions to children with imperforate anus:

Before my research many centres all over the world operated on these children in three stages:

i. Initial colostomy done in the neonatal period to divert faeces away from the anus
ii. Second operation to open up the anus (posterior sagittal anorectoplsty (PSARP)
iii. Third operation to close the colostomy

A few centres who operated on them as single stage had facilities for parenteral nutrition.

In Nigeria, as in many third world countries, colostomy bags are not readily available, stomal-nurses are few, many parents are illiterates and live far from medical centers, and there may not be parenteral nutrition.

In our ten-year review, Adeniran and Adekanye (2003) found that less than 25% of patients diagnosed with imperforate anus completed the three operations. Many children who had colostomy did not present for second stage of the operation. They must have died of colostomy-related complications.

The main thrust of Adeniran's research was to skip the colostomy stage and perform these operations in ONE stage instead of three.

Adeniran tried the operations on females first because:

1. they had decompressing recto-vestibular fistula, making neonatal operation unnecessary
2. most anomalies were intermediate or low. Rectum was easy to access from a posterior sagittal approach

Adeniran decided to operate on the females at about 4 months of age because:

1. They were still exclusively breast fed and the stool relatively abacterial
2. Stool was fluid
3. Cuddling with mothers decreased analgesia use

Adeniran's intraoperative contributions:

a. Initial Incision-surgeons should make transverse incision to mark anoplasty site Fig. 33.

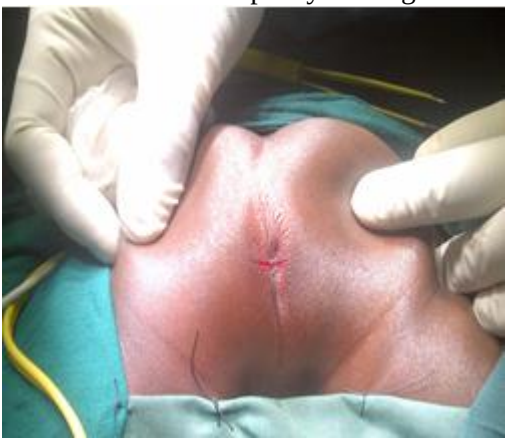


Fig. 33. Initial incision—make transverse incision to mark anoplasty site

b. The posterior sagittal incision should not reach the forchett. The idea is that if there is superficial wound dehiscence, it will not extend into the vestibule.

c. Ligate the fistula form 'within'
Many surgeons completely core out the fistula. I think this is only unnecessary but adds to the infection spreading to the vestibule. Adeniran proposed that the fistula be ligated through the posterior sagittal incision (Fig. 34).

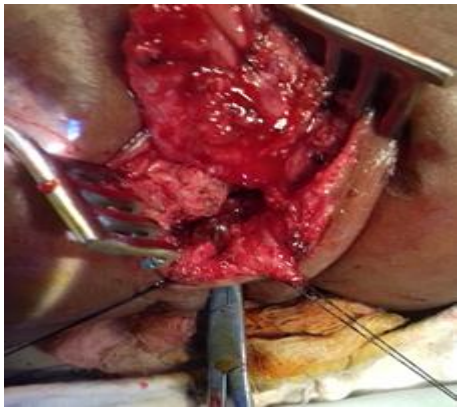


Fig.34. Fistula identified with probe—easy to ligate from "within"

d. Venting the new anus with syringe after the operation

After the PSARP, a syringe vent is inserted (Fig. 35). When the patient is put in prone position after the operation the fluid faeces flows out freely away from contaminating the posterior sagittal wound.

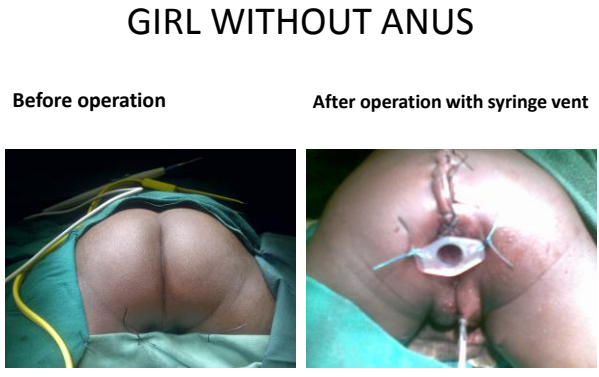


Fig. 35. Girl with imperforate anus

The advantages of the syringe are:

1. It is cheap and readily available
2. It is inert and does not react with body tissues
3. It has flanges that can be anchored around the neo-anus
4. As there is no parenteral nutrition, the patient can start feeding as soon as recovered from anaesthesia.

By this method Adeniran (2002) was able to perform this operation of fashioning new anus for these children in only ONE operation instead of THREE operations as practised then in many centres in the world.

Train the trainers

During the APSON conference in Ilorin in 2010, at a live operation, Adeniran taught this method of refashioning a new anus in females without a colostomy and with anal venting with syringe to a whole generation of Paediatric Surgeons all over Nigeria. This method is now widely used by these surgeons.

Research on boys with intermediate imperforate anus

After Adeniran has gained enough experience on operating on females with imperforate anus without colostomy, I started research on males with intermediate anorectal anomalies. Adeniran's criteria for these children were:

1. There must be no other major congenital malformations
2. Patient must present early with no evidence of systemic infection
3. Parents must accept a colostomy, should our one-stage operation fail

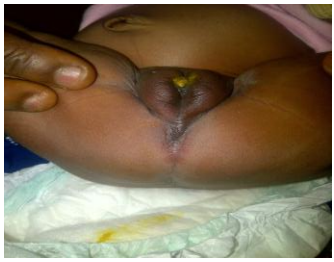
Many patients were operated on under this protocol, (Fig. 36), and the results were published in several international journals (Adeniran 2003, 2005).

Fig.36. Venting with syringe in boys after posterior sagittal anorectoplasty

Experience with cloacas

Mr. Vice Chancellor, sir, I cannot conclude my presentation on Anorectal Anomalies without mentioning children with cloacas.

Cloacas are the extremes of anorectal anomalies in females. These are children in which the urethra, vagina and anus exit in only one orifice (Fig. 37).



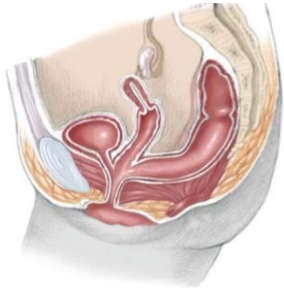


Fig. 37. Cloacas

This is because embryologically the Urorectal Septum (Tournex Fold) fails to reach the cloaca membrane. We only operate 2-3 of these children every year.

Fig. 38. Operated cloaca awaiting closure of colostomy

Sometimes the rectum can be difficult to find during the posterior sagittal operation. Adeniran (2011) advised that a large naso-gatric tube if inserted into the distal limb of the colostomy can help identify the end of rectum. Their operations are not particularly difficult but are particularly delicate, as any mistake can make them miserable for life from faecal and/or urinary incontinence.

After my extensive research in Anorectal Malformations, I presented my findings at the World Congress of Paediatric Surgery in Delhi, India, in 2010 (Fig. 39)

Fig. 39. Presentation at 3rd World Congress of Paediatric Surgery

Children with ambiguous genitalia

Mr. Vice Chancellor, sir, I must finish my lecture on one major problem a Paediatric Surgeon may come across. Patients with ambiguous genitalia. Normal males and females are easy to identify at birth. A male, by definition, has a well-developed penis and at least one good-size testis in the scrotum. A female has easily recognizable labia which, when parted, reveals a vaginal introitus. This is what obtains in a large percentage of the population. But in a very few unfortunate **'monsters'**, the picture is not clear-cut. These children have ambiguous genitalia (Fig. 29). What makes the management of these children even more difficult is that the parents might have assigned the wrong sex to these babies. Worse still is that ignorance and illiteracy might play a significant role so that parents do not follow the advice of the doctor.

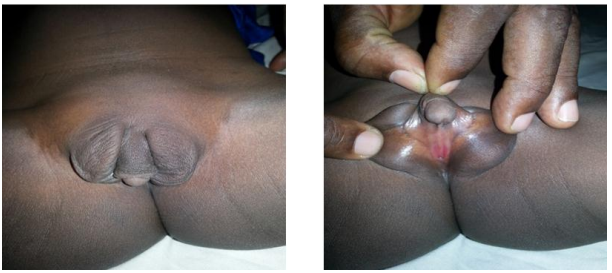


Fig. 29. Child with ambiguous genitalia

Because of our time let me give you just one example. A beautiful set of identical twins presented with ambiguous genitalia when they were only three months old (Fig. 30)

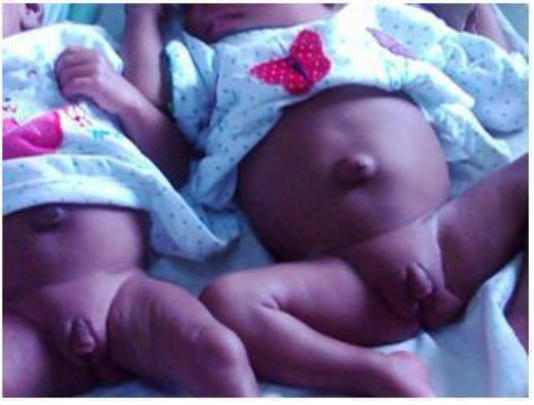


Fig. 30. Identical twins with ambiguous genitalia

From our assessment we think they were both males with severe defects on the undersurface of the penis. We advised the mother to bring them back at about a year to plan their definitive operations. We did not see them until they were 3 years old. They suddenly appeared grown up wearing knee-length hijabs (fig. 31).

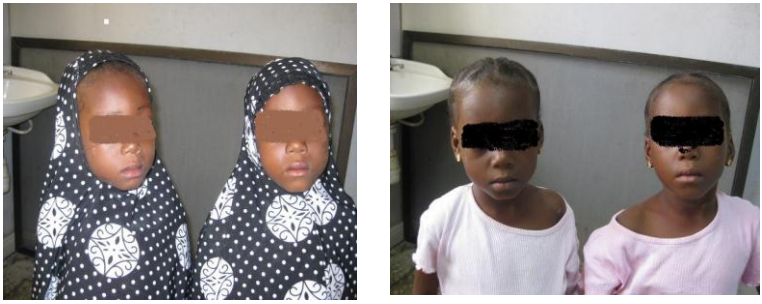


Fig. 31. Twins at 3 years

When they undressed we noticed that the parents had taken them for 'circumcision' where the native doctor had completely cut off their penises (Fig. 32)

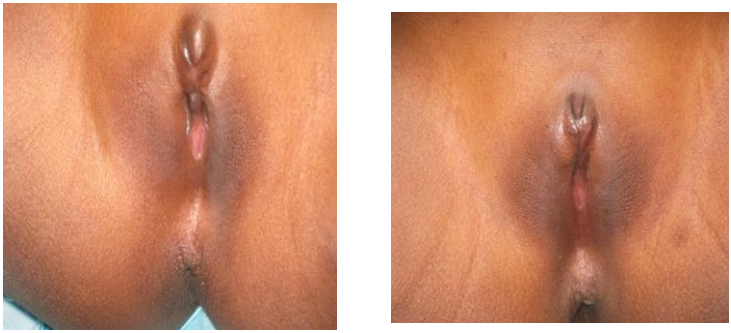


Fig. 32. Perineum of twins after "circumcision"

We were shocked. We were livid. The mother said it was the father's mother that took the babies somewhere behind her back. These children were born males. The parents have converted them to '**real monsters'** because of ignorance and poverty. How will these children live their reproductive lives? I appreciate the research of my colleagues, Dr. Abdur-Rahman and Dr. Nasir on this subset of patients.

New frontiers for Paediatric Surgery in Ilorin

Laparoscopic Surgery

This is surgery through a key hole. In many centres in the world, key-hole surgery is preferred to open surgery because of better cosmesis and earlier return of patients to work. I thank Dr. Abdur-Rahman and Dr. Nasir (my other consultants in paediatric surgery) for developing this branch of surgery in UITH. Our unit is the first to start key-hole surgery in UITH. We have developed ourselves such that we are now invited as resource persons to teach key-hole surgery in many centres in Nigeria. We have used key-hole surgery for two purposes:

a. **Investigations**

Perhaps our main use of laparoscopic surgery in concluding investigations on patients with ambiguous genitalia. It is not obvious from external appearance whether these patients are male of females. Many of the tests we do like ultrasonography may not completely confirm the full extent of the internal organs. " Seeing is knowing". This key- hole surgery allows us to put a camera inside the abdomen to see accurately which internal organs are present and which are absent. Even more important, we can take specimens from different organs for histology.

b. Therapeutic

We have recently started performing simple definitive operations like appendicectomy and pyloromyotomy. With provision of modern instruments we hope we would be able to perform more complex definitive operations. I hope my colleagues, Dr. L. O. Abdur- Rahman and Dr. A. A. Nasir will continue the excellent work they are doing in that field and make their result the basis of their own inaugural lectures in the near future.

New frontiers for Paediatric Surgery in Nigeria

I read recently that a hospital completely dedicated to care of children has just been commissioned in Kano State. This is a welcome development. The first hospital dedicated to care of children was in Paris in1802, then Great Ormond Street Hospital in London in 1852, and in Boston in 1882. We can now see that we are some 150 years behind these developed countries. South Africa has the Imperial War Memorial Hospital exclusively dedicated to care of children. I must add that children receive FREE treatment in these hospitals.

These dedicated hospitals are important because they are also staffed with specialists trained in different aspects of children's diseases and all equipments are specialized to children.

Conclusion

Mr. Vice Chancellor, sir, by God's special grace, I have laid the solid foundation. The University of Ilorin Teaching Hospital is now a center of excellence for surgical management of children's diseases. My colleagues, Dr Abdur-Rahman and Dr. Nasir, are building on that foundation to make us a world-class centre.

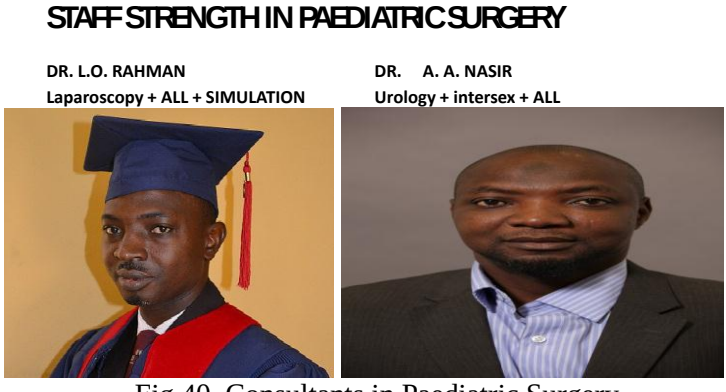


Fig.40. Consultants in Paediatric Surgery

Dr. Lukman Abdur-Rahman specializes on laparoscopic surgery and is the University co-ordinator of the Simulator Centre. Dr. Nasir also does many laparoscopic operations, but has special interest in genito-urinary re-constructions and children with ambiguous genitalia. They are now being invited all over Nigeria as resources persons in laparoscopic Surgery. God will help them.

Recommendation

1. Equipments—our success in neonatal operations like Oesophageal atresia, ruptured omphaloceles and gastroschisis has been poor. We need neonatal ventilators, parenteral nutrition etc.
2. Staff—The Paediatric Surgical Unit of Teaching Hospital Ilorin has a complement of 30 beds. We have found this adequate for our use. But there are not enough Paediatric-Trained nurses and no proper monitors in the ward like pulse oximeter.
3. A new theater has just been provided in the New Emergency Paediatric Unit of the hospital. I will be grateful if this theater is made functional.
4. At least one hospital completely dedicated to care of children should be built in each geo-political zone of Nigeria. The funding of these hospitals should jointly be by government and companies and NGOs and private individuals.

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I thank my late father Pa Isaiah Adeniran. I have written his life history but could not read it because of time. He sacrificed

everything for the education of his children. One day he asked me for the 'pleasure' car I always promised him. 'Don't worry Baba mi, I will buy it for you' I promised. But alas, he was on his death bed, and did not come out of hospital. But like Abraham, he did not receive what God (and I) promised, but saw it from afar. By God's grace there are at least 20 cars presently registered in ADENIRAN's name.

My mother is sick, today I salute her. A colleague gave an inaugural lecture here sometimes ago. He was the only child and thanking God for the life of his mother, he said 'she came, she saw and she conquered'. So what can I say about my mother when directly from her there are TWO of us professors, TWO engineers, and TWO graduates (one of them with a PhD): and of her grandchildren FIVE medical doctors, and at least TEN university graduates in different disciplines. Ah our sweet mother. We all thank you for the wonderful education you have given us all.

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