OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA.

Inaugural Lecture Series 196

THAT THEY MAY HAVE LIFE...

By

Olusanya Adejuyigbe
Professor of Paediatric Surgery

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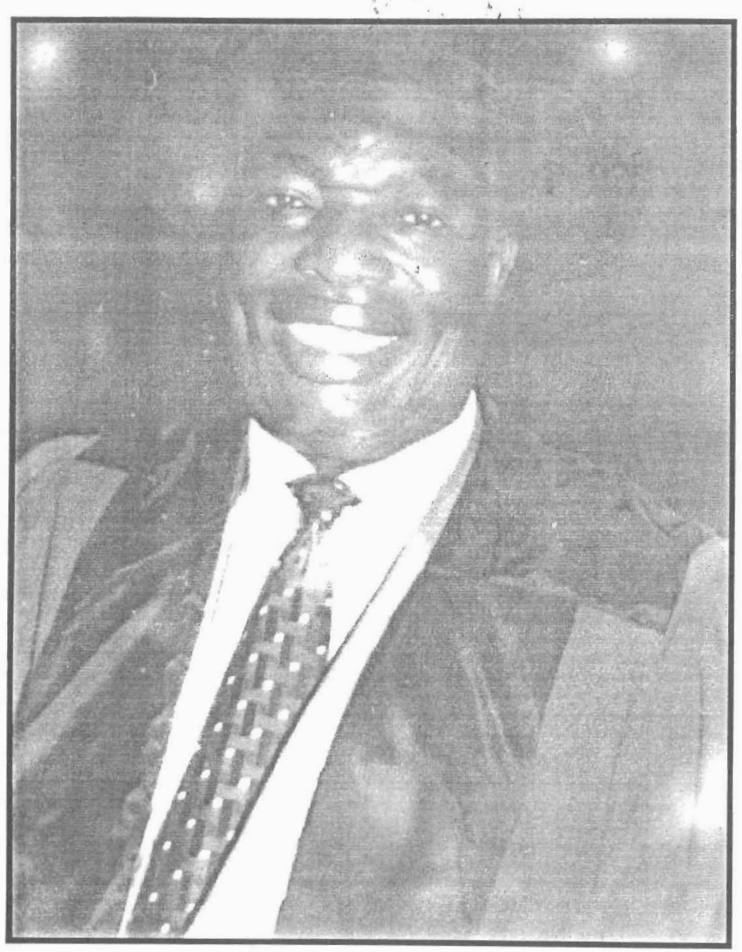

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Introduction

Mr. Vice Chancellor Sir, it is with immense gratitude to God that I stand before you and this august assembly today to deliver this Inaugural Lecture. This is the third from the Department of Surgery in the College of Health Sciences. The first Inaugural Lecture from the Department was on "The Dilemma of the Academic Surgeon" which was given in 1992 by my Teacher and Mentor Professor M.A Bankole.

Medicine in the Beginning

Life has always been regarded as a divine gift in every race or religion down the ages. In the Christian *Holy Bible* we read that God breathed into the nostrils of the first man to make him become a living being (Genesis 2: 27). It is probable that since man knows that the life he has is a gift that once lost can never be regained; he had always made self preservation the first law of nature. Thus man has always sought the healing, cure or removal of any ailments or bodily perturbations that may threaten the continuation of life.

It is probable that as soon as man reached the stage of reasoning, he discovered by a process of trial and error which plants might be used for food, which plants were poisonous and which of them had medicinal properties. Folk medicine which consists largely of the use of vegetable products or herbs originated in this fashion and still persists till today. With time, some people within the community would have acquired more knowledge and expertise in the use of such plant products in the treatment of ailments. Thus would have been born the early practitioners of the healing arts (Science?).

In ancient times man, did not regard death and disease to be natural phenomena. While common nuisances and as colds and constipation were accepted as part of everyday living, more serious ailments were placed in a different category. They were conceived to be of supernatural origin, the work of a malevolent demon or an offended god who had either introduced something into the body or removed something usually the soul or the essence of life from it. It was

believed that such ailments or diseases with a supernatural origin could not be cured by the use of herbs alone. The treatment then applied would involve the appeasement of an offended god to restore the essence removed or the confrontation with the demon to extract the offending demon or dart by various means such as suction, incantation or other means. One such mean was to make a hole in the skull - trephination (trepanation) to allow the offending demon or evil spirit to escape. Trepanned skulls dating from prehistoric times have been found in Britain, France Peru and Mali in West Africa... (figure 1)

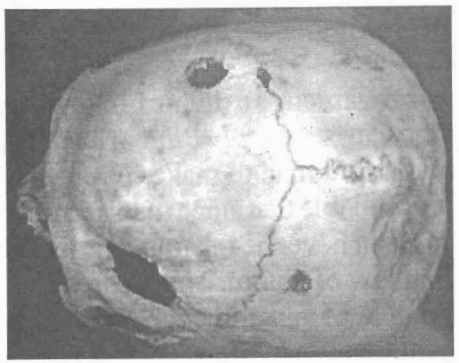


Fig. 1: A Trephinated Skull

The involvement of the supernatural in the causation of disease and ill health in the peoples belief system meant that those who would care for people afflicted with such diseases must be capable of interaction with supernatural beings. Thus magic and religion played a major role in the care of diseases of prehistoric or primitive man. The use of charms, incantations and talisman became prevalent in prehistoric medicine and has persisted even till today in some cultures.

In every ancient civilization Babylonian, Indian, Egyptian, Greek, Chinese or Japanese all those who have dedicated their lives to the healing arts have been venerated. In the ancient world of Egypt and Greece, they were even elevated to the status of deities. The vestiges of such deification persist till today since the original Physicians oath made reference to Aesculapius who many regard as a mythical being or god who cured illnesses in ancient Greece. Also Imhotep, a multitalented physician in ancient Egypt is being worshiped as a god in some circles even today.

From Magic to Science .... The Great Transition

The transition from magic to science in the practice of medicine was gradual and lasted many centuries. The impetus was provided by the works of the early Greek philosophers which led men to refuse to be guided solely by supernatural influences but seek to discern for themselves the causes and reasons for observed phenomena in nature including the diseases afflicting man. Although many of the theories and concepts proposed by the philosophers and Doctors of that era to explain the origin and natural course of disease in man were eventually found to be untrue their efforts marked a veritable stage in the development of human reason. It was during this phase of the evolution of medical thought that Hippocrates was born in the Greek island of Cos in 460 BC. (Figure 2)

Fig. 2: Hippocrates (460 BC -) The Father of Medicine

While little is known about his youth and manner of education, it is indisputable that when he grew up he practised and taught medicine in the island of his birth. He promoted the belief that all diseases had natural causes and based his treatment regimen on this. He advocated minimal intervention on the part of the attending physician in the firm belief that nature acting on the human body will provide the cure for any ailment.

The Doctor's business in the view of Hippocrates must be "to assist the healing force of nature, to guide that force and to avoid counteracting it". The best form of treatment therefore became dietetic through which the patient's manner of life was regulated through modification

of the diet by which it was believed the humours of the body would be regenerated. The Hippocratic physician therefore developed a mastery of dietetics. If dietary control failed to achieve a cure then resort to drugs was made. In the days of Hippocrates such drugs consisted mainly of vegetable materials collected by skilled herbalists.
There is still some controversy in certain quarters as to whether all that were attributed to Hippocrates were actually his works. While such views may have some foundation, there is no gainsaying the fact that Hippocrates actually lived and lived his life and practiced his art serenely and sacredly. He is still regarded today as the embodiment of the ideal Doctor. He developed the charter of medical conduct for doctors now known as the Hippocratic oath and this is regarded by some as his greatest legacy to the medical profession.

Through his efforts and those of his school of medical thought in Alexandria in Egypt and others such as, Galen who practiced many centuries later in Rome and others in Salerno in Italy, the scientific approach to the understanding and treatment of human disease continued to gain ascendancy in spite of the occasional dissenters who still held on to the lure of magic and superstition.

The Influence of the Renaissance in Europe on early Medical Practice

The change in outlook and eagerness for exploration and discovery promoted during the Renaissance in Europe between the 14th and 16th centuries was a major boost to Medicine. This was because it stirred the natural curiosity in man to understand the nature and workings of the human body. Thus the study of human anatomy and physiology began to receive attention from those intent on promoting reform. This atmosphere made possible the works and discoveries of Vesalius, Fallopius and Fabricius who practised and taught medicine at the University of Padua in Italy. Fabricius it was who published his discovery of the venous valves in 1603 and his pupil William Harvey subsequently discovered the circulation of blood in 1628. [Exercitatio *Anatomica de Motu Cordis et Sanguinis in Animalibus*.

(An Anatomical Exercise on the Motion of the Heart and Blood in Animals)]

The experimental and investigational approach pioneered by these early masters continued to flourish that by the beginning of the 19th century the gross structure of the human body was almost fully known. In addition, the earlier invention of the microscope before this time permitted the initial studies of the microscopic anatomy of human structures and organs.

The Early Surgeons

After the practice of medicine ceased to be dominated by priests and religious orders, medicine passed into the hands of laymen. Surgery is that branch of medicine that is concerned with the art and practice of treatment of injuries, deformities and disorders by manual and instrumental manipulations rather than drugs and diet. The name surgery derives from the *Latin* word *chirurgia* which in turn comes from the *greek cherros*(hand) and *ergon* (work). Surgical care was provided by a group of laymen known as barber surgeons in the western world. These barber surgeons often acted on their own responsibility but many times they were called in by physicians to be involved in the management of patients. On such occasions it was not unusual for physicians to dictate what the barbers could do or not do on the patient!! While some barber surgeons such as Ambrose Pare in France became very proficient and acquired fame, majority were not more than rough and ready wielders of the knife. This was because at that time the practice of surgery was not taught in Medical Schools in the Universities. The major concerns of these early surgeon can be glimpsed from this statement credited to Ambroise Pare: "There are five duties in surgery: to remove what is superfluous, to restore what has been dislocated, to separate what has grown together, to reunite what has been divided, and to redress the defects of nature". It was not until 1540 during the reign of Henry VIII that an attempt was made to organize the company of barber surgeons in London into a guild. This development marked the beginning of the enforcement of some control on the qualifications and training required for performing

surgical operations. This Company of Barber Surgeons of London lasted for about two centuries and it was the precursor of the Royal College of Surgeons of England. Similar changes were also taking place in the organization of the barber surgeons in other countries in Europe. The result was that by the end of the 18th century and the beginning of the 19th, the teaching of the principles and practice of surgery was firmly established in the curriculum of Medical Schools in Europe.

The Germ Theory of Infections

A major advance in the practice of medicine in the 19th century was the firm establishment of the germ theory of infections and diseases. Though numerous workers since 100 BC had proposed that diseases in man were caused by the entrance of unseen animalcules into the body, it was left to Louis Pasteur who through a series of brilliant experiments on the fermentation of wine, anthrax and rabies conclusively demonstrated the activities of microorganisms in causing diseases and in the general affairs of man. (Figure 3)

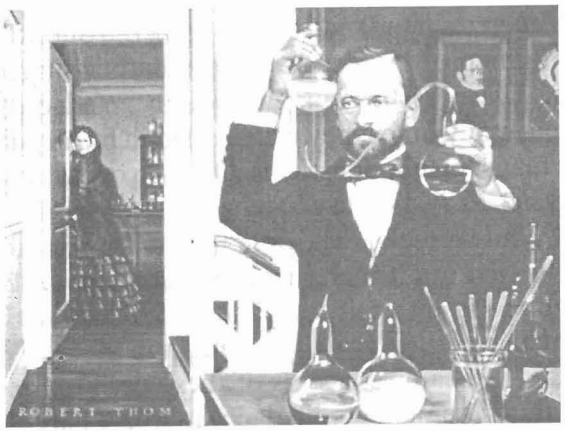


Fig. 3: Louis Pasteur - Demonstrated that micro-organisms caused disease in man

Joseph Lister, Professor of Surgery at Glasgow University introduced the principles of antisepsis into surgery in 1865.
He was greatly influenced and inspired by the work of Louis Pasteur

in placing an antiseptic barrier made up of a carbolic acid spray between the wound made by the surgeon and the environment to keep away germs. His initial observations that infections occurred only in Compound fractures in which a breach of the skin has allowed the exposure of the underlying tissues to the environment led him to suppose that the germs that caused the infection existed only in the atmosphere. He was later to know that germs were not only airborne but could also be transferred in the hands of the surgeon, instruments and other materials that came in contact with the patient and his wound.

The principles of antisepsis pioneered by Joseph Lister placed surgery on a new footing. Before this time, the early surgeons had to contend with a triad of major, apparently insurmountable obstacles that hindered their practice. These were Pain, shock and infection. The works of Lister a surgeon and such obstetricians as Alexander Gordon (Aberdeen, Scotland), Oliver Wendell Holmes (Boston, USA) and Ignaz Semmelweiss (Vienna, Austria) who advocated the disinfection of the hands and instruments of midwives with carbolic acid were definitive steps in frontally combating the scourge of wound and postnatal infections. While the principles of antisepsis which involved destruction of contaminating microorganisms espoused by these workers and subsequently that of asepsis which involved the prevention of contamination by microorganisms represented major progress in the control of surgical and obstetric infections, the surgeon had to await the discovery of drugs such as salvarsan by Paul Ehrlich, sulfanilamide by Gerhard Domagk and penicillin by Alexander Fleming and Howard Florey in the first half of the 20th century to really put the problems of infection in surgical practice in check. Though postoperative infections still represent a major cause of morbidity and mortality in the surgical patient with the attendant economic and social costs even today, we are however a long way from those early days when the presence of suppuration in a surgical wound was the rule that it was considered a sign of the normal healing process and therefore laudable!!!

From the earliest days the surgeon had always treated patients suffering from injuries sustained either in war or through accidents.

In addition, he had always inflicted some wounds of his own in the course of carrying out surgical operations. Consequently minimizing the pain his patients were undoubtedly feeling was a major consideration. The initial approach was to limit the duration of the procedure carried out on the patient. Surgeons therefore had to be very fast and skillful. The reputation of surgeons was determined by how fast they could carry out a procedure. Consequently surgical procedures became speedy and spectacular. Some surgeons were reputed to be able to carry out an amputation of the lower limb within three to five minutes!!!

In such a setting, surgeons acquired a reputation for showmanship in a rough and ready situation. There were instances in which the surgical assistant had some fingers cut off because he could not move his hands off the operative field fast enough during an amputation. Also, patients may have to be tied down or restrained by powerful assistants to allow a procedure to continue. (Figures 4, 5 & 6)

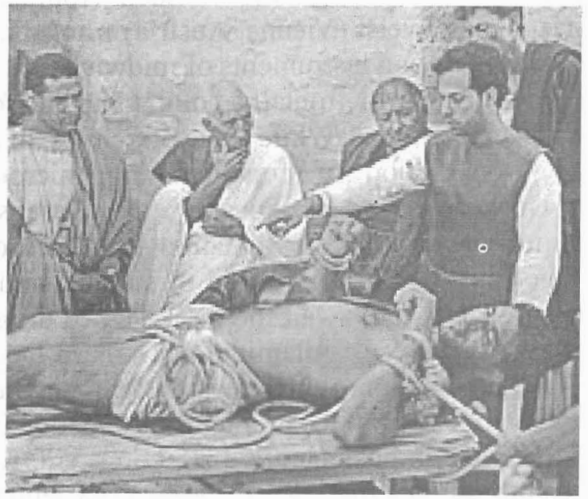


Fig. 4

Fig. 5: Patients being restrained before surgery prior to the advent of anaesthesia

At a later stage, patients were rendered inebriated with either opium or alcohol to permit surgeons to work.

All these imposed limitations on how deep within the human body a surgeon could hope to explore. As a consequence, most procedures were either amputations or others limited to the superficial parietes of the body. It was therefore not unexpected that some surgeons were experimenting with many drugs and vapours to see which could be inhaled by the patient to cause anaesthesia. The first to report a success was William Thomas Morton who in October 1846,

demonstrated the use of ether inhalation as a general anaesthetic at the Massachusetts General Hospital in Boston, USA. A year later in November 1847, James Young Simpson demonstrated the use of chloroform as a general anaesthetic in Edinburgh, Scotland. Thus was born the era of general anaesthesia. In later years, other agents were discovered which were safer to use than ether or chloroform. The availability of general anaesthesia made possible great advances in surgery. It emboldened surgeons to explore the abdomen and other body cavities and thus permit developments of various surgical procedures which would otherwise have been impossible.

Shock, the series of complex systemic and sequential metabolic changes occurring in the body following the gross reduction in the perfusion of the tissues by blood was the third major obstacle confronting early surgeons in their practice. Not unexpectedly it was initially adjudged to be caused by blood loss alone. As surgeons became more adventurous with the introduction of antisepsis/asepsis and general anaesthesia, the study of shock, its causes and effects on human physiology as well as the ways of its prevention and treatment became the preoccupation of surgeons and non surgeons alike. A major breakthrough in this regard was the discovery of the blood types by Karl Landsteiner an Austrian Biologist at about 1900. This discovery made safe blood transfusion possible. Subsequent research has shown that shock can also be due to other causes besides blood loss and in the early 20th century many of these were recognized and appropriate treatment and preventive strategies were adopted.

Thus by the early 20th century the surgeon became at last liberated from the constrictive bondage imposed by the fear of pain, pus and shock. This coupled with the discovery of X-rays by the German Physicist Wilhelm Conrad Rontgen 1895 and other discoveries in immunology, pharmacology, endocrinology, nutrition and other fields of human biology made surgical procedures considerably safer partly by improving the accuracy of the diagnosis of surgical disease and also by providing more therapeutic tools to the surgeon. Thus empowered, the surgeon became bold and daring in his management of patients. The scope of surgery increased explosively.

The surgeon also learnt through experience the merit of painstaking and meticulous operation, treating the tissues gently and carefully controlling bleeding points as the surgical operation progressed. He also found out that he could not solve the patient's problems all alone by himself and he learnt to call on colleagues in other branches of medicine as well as in other scientific disciplines for help as the need arose.

At first most surgeons treated all patients who presented themselves to their practice as best as they could. They could therefore be called General Surgeons. Because of the frequency of traumatic injuries and infections affecting bones, there had long been surgeons who restricted their practice to orthopaedic surgery alone. Also such fields as ophthalmology, obstetrics and gynaecology had long had a set of surgeons committed to making them their chosen fields perhaps because of the specialized anatomy of the eye and the popularity of midwifery. Nevertheless even among general surgeons it became apparent before long that to achieve progress in certain areas surgeons had to concentrate their attention to that particular subject. Thus was born the need for specialization in various branches of surgery.

Paediatric Surgery, to be or not to be?

Paediatric surgery is the branch of surgical practice dedicated to the care of children with injuries, infections deformities and diseases in children until the age of 15 years. Children had always suffered from conditions and ailments requiring the special skills of the surgeon for relief. Such conditions have varied from epoch to epoch and from one geographical zone to the other. In the early days, the diseases and ailments that would bring the child to the surgeon were infections, injuries and the occasional congenital deformities that did not result in death at birth or shortly thereafter. It is therefore not surprising that the records of surgical procedures in children in the late 19th and the up to the middle of the 20th century are full of interventions for such conditions as tuberculous infections of the bones and joints, osteomyelitis, collections of pus in the chest etc. These procedures were in the main carried out by General surgeons who devoted

varying proportions of their professional time to the care of children. As their practice expanded and the number of children seeking their expertise increased, some of them ended up devoting their entire time to surgical care of children. Such revered men of paediatric surgery as Dennis Browne, Gross and Ladd were of this mold. This development enabled them to study the aetiology, and understand the pathology and pathophysiology of the various conditions they encountered in their young patients. It also allowed them to attract a crop of younger trainee surgeons who wanted to follow in their footsteps. This latter development was given an impetus by the realization in Europe, North America, Australia and China of the need for the establishment of children hospitals where all specialists skilled in the care of children can be assembled to practice.

By the end of the 2nd World War, a pool of surgeons with experience and expertise in paediatric surgery were available in most countries in Europe North America and Australia. These surgeons had also succeeded in formulating treatment protocols for some surgical conditions in children such as the Ramstedt's pyloromyotomy for the treatment of hypertrophic pyloric stenosis, the treatment of hypospadias and club foot popularized by Dennis Browne.

Many of these early paediatric surgeons were either self taught in that they had acquired their skill from years of experience and commitment to the care of childhood surgical diseases or had trained under such a self taught master.

This emerging trend towards specialization in surgery met with varying degrees of resistance in many countries. This was because the older generation of surgeons felt that if unchecked, the contributions of generalists would be decried. Nevertheless, by 1953, the need for the establishment of a national association of paediatric, surgeons in Britain was felt compelling. According to the founders, this was not because specialist paediatric surgeons wanted to establish a monopoly, but to create an atmosphere for the advancement of the specialty and set standards for the improvement of surgical care in children. Thus was born the British Association of

Paediatric Surgeons (BAPS). From the outset this association had an international outlook and because of this it acted over the years as a stimulus for the advancement of the specialty not only in Britain but in other countries of Europe and as far afield as China, Japan, Australia and South Africa.

From inception, paediatric surgeons have focused their attention on how to make the children survive the conditions whether congenital or acquired that brought the children to their practice. With improvements in medical knowledge and the technology to care for even the smallest babies, there has been a great improvement in the survival rate for children after treatment by paediatric surgeons. In many countries, there now exists a large pool of babies who had been operated upon in the first few hours or days of life who have survived not only to adulthood but to advanced age. Many paediatric surgeons have treated two or three generations of the same family.

As more patients have survived, we have acquired knowledge on the long term effects of some congenital and acquired diseases and/or the original surgical operations to correct them. Invariably, these have led to new methods of managing children with such diseases (Examples: Hirschsprungs disease, diaphragmatic hernia, undescended testis .....). These experiences have led paediatric surgeons to have a greater consideration for the long term view of the health and well being of their patients perhaps more than any other group of Doctors. They cannot indulge in the luxury of talking about 5, 10, 20 or even 30 year survival rates for their treatment options or procedures when the baby has a life expectancy of 70 or more years. The treatment the paediatric surgeon offers must of necessity ensure that the child concerned not only survives, that is have life at the end of it all, but should not suffer any encumbrance or limitations in any form that will prevent a full realization of his/her potentials in life. Paediatric surgeon can thus justifiably claim that we strive that our patients have not just life, but life in all its fullness.

I therefore chose the title of this Inaugural Lecture which is a paraphrase of the statement by the Lord Jesus Christ in John 10: 10 to highlight this passion in our hearts. Disease and deformities come to steal, kill and destroy the life of the children, but paediatric surgeons

are involved so that they may have life and life in all its fullness.

Paediatric Surgery in Nigeria

The practice of paediatric surgery in Nigeria has followed the pattern in other parts of the world in that for a long time, the provision of surgical care for children devolved mainly on General surgeons many of whom until political independence in 1960 were expatriates in government or mission hospitals. As more indigenous surgeons were trained initially in Britain and USA, they too became involved in caring for children. The very idea of sub specialization by surgeons would have been considered ludicrous in those early days because surgeons were few and far between. The establishment of Nigeria's first Teaching Hospital, the UCH, Ibadan in 1956 provided the opportunity for more Doctors to be trained locally. Some of these Nigerian trained doctors eventually traveled abroad for specialist training. One of them, Dr. M.A Bankole who graduated from the UCH Ibadan in 1960, came back to the UCH in 1968 after undergoing training in the USA as Nigeria's first trained specialist paediatric surgeon. (Figure 7)

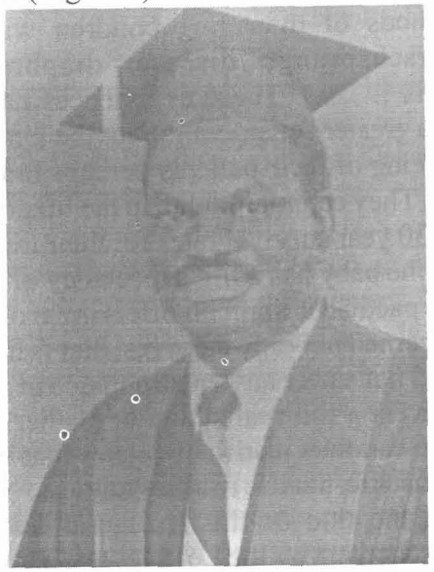


Fig. 7: Prof M. A. Bankole the first Professor of Peadiatric Surgery in Nigeria

He later transferred to the University of Ife in 1972 as a Professor of Paediatric Surgery and a member of the pioneer staff of the Faculty of Health Sciences (Now College of Health Sciences). Our University (OAU) thus had the distinction of appointing the first Professor of Paediatric Surgery in the country. I consider it a great privilege to have been trained and mentored by him. Apart from Professor Bankole, there are others who have made immense contributions to Paediatric surgical practice in Nigeria. People like Late Professor Omodare, Professor Nwako and Professor Adeyemi

There are at present two bodies supervising and controlling standards in postgraduate surgical training in Nigeria. These are The West African College of Surgeons (WACS) which also covers other countries in the West African Sub Region and The Faculty of Surgery of the National Postgraduate Medical College of Nigeria (NPMCN). These two bodies currently have prescribed curricula for the training of Surgeons in Nigeria and they are involved in the training of paediatric surgeons.

Through their efforts there has been a steady increase in the number

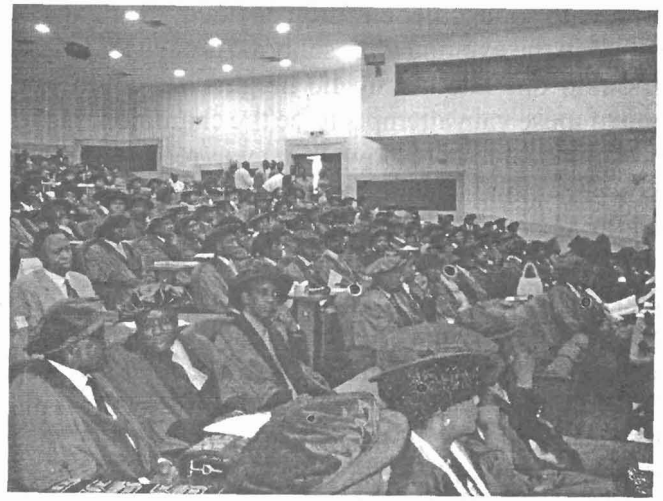


Fig. 8: A cross section of fellows of the West African College of Surgeons at their congress.

of practising paediatric surgeons in the country. There are currently about 40 paediatric surgeons providing surgical care for the 60 million children in the country. Obviously the number is grossly inadequate and general surgeons have had to meet the needs as best as they could in situations where paediatric surgeons are not available. About 5 years ago, the national association of Paediatric Surgeons was launched in Nigeria after many years of planning and propositions. This is the Association of Paediatric Surgeons of Nigeria (APSON). This body shares with similar bodies in other counties of the world the objective of promoting excellence in the surgical care of children. This it does by organizing scientific meetings for its members and associates and through interaction with the training bodies in the country for setting standards.

My Work and Contributions

Epiphany.....

The flame of my passion for Medicine as a career could be said to have been ignited on Friday April 19, 1961 when as an 81/2 year old boy, I along with some other children decided to engage in the sport of high jump in the evening after school. As such things go we got to trying to outdo one another in the heights we could jump. It was during one of these vain attempts to be the champion that I fell on my left arm and dislocated my elbow. What was remarkable to my young and frightened mind then was that my forearm was turning backwards and I could not control it. This coupled with the attendant excruciating pain naturally led to howls from me and my people were summoned and I was taken to the hospital in Akure that evening. The doctor was summoned, and after examining me eventually applied a POP plaster cast to my arm. This was in place for a few weeks and all the while I continued to be afraid that perhaps after the removal of the cast the arm would remain permanently deformed. This fear was heightened by my relatives who kept reinforcing the fact that I may suffer permanent deformity perhaps in an attempt to keep me from such escapades in the future. When eventually the cast came off and my arm was not only not deformed, but was stable and could be used

my relief knew no bounds. Deep within me I desired to become a Doctor like the man who had helped me so that I also could comfort others.

That was 45 years ago and many waters had passed under the bridge since then!! All the while, I had enjoyed an abundance of goodwill and favours from God and men that today I stand before you all to testify that my childhood dreams have been realized.

After leaving the Medical School at the UCH Ibadan in 1975, I was privileged to work under experienced and committed missionary Doctors at the Ogbomoso Baptist Hospital who were my Supervising Consultants. Consequently, I gained a lot of experience especially in Surgery as well as in Obstetrics and Gynaecology. This served me in good stead during my National Service year at the Mater Misericordiae Catholic Hospital, Afikpo (now in Ebonyi State). There I was responsible for the management of all surgical patients in a 30 bed ward. During this year, what I had learnt as a House Officer was put to good use and I gained further operative surgical experience.

My Journey into Paediatric Surgery

I started my specialist surgical training at the Obafemi Awolowo University Teaching Hospitals Complex in 1977 under Professor A O Arigbabu who made sure that during the first three years between 1977 and 1980, when I was undergoing General Surgical training, I was given extensive exposure in the art and science of surgery.

Throughout my Medical Student days at the UCH Ibadan and during my General Surgical training I had been intrigued by the challenges posed by congenital malformations in children. This spurred me to make a career in Paediatric Surgery. Consequently after general surgery training, I joined Professor Bankole's Paediatric Surgery Unit at the OAUTHC on December 8 1980(About 26 years ago). While in training under him, I had the opportunity to go on one year training attachment in the Department of Paediatric Surgery at the Sophia Children's Hospital in Rotterdam, The Netherlands. At that Centre in addition to clinical work, I had the opportunity to undergo a four week course in Microsurgery.

I also conducted research on the influence of kidney maturation on amino glycoside nephrotoxicity which was later written up as my thesis for the Part II FMCS examination.
I joined the Department of Surgery of the OAU in October 1985 upon completion of my postgraduate residency training a while earlier. My mentor, Professor M.A Bankole had just retired from the services of the University to assume the duties of the Registrar of the National Postgraduate Medical College of Nigeria in Lagos. I consider it a measure of his confidence in my ability that he could entrust me with the task of tending the flames in the Paediatric Surgical Unit that had been synonymous with his name. I praise the Lord today that the unit had not only survived but we have been able to produce many grandchildren for Professor Bankole!!!

My Research Focus

Between my appointment in 1985 and up till 1998, I was the only Paediatric Surgeon providing clinical and academic services in our University and the OAUTHC. In 1998, I was joined in the unit by another consultant, Dr O.A Sowande who is an alumnus of the Unit. In spite of the heavy clinical workload in those early days, I realized that we should also advance the frontiers of knowledge and practice by carrying out studies to clarify extant issues in the field from the standpoint of Nigeria.
Consequently, my research efforts have been directed at defining the clinical characteristics and problems encountered in the management of surgical conditions in children. This was borne out of a firm belief that attempts to improve the surgical care of children in Nigeria can only bear fruit only if they are predicated on an understanding of the pattern and manifestations of such diseases in children and the peculiar problems imposed by our current socioeconomic status on the management of such conditions. The thrust of my research efforts and contributions to knowledge can be grouped as follows:

Acute Abdomen in Children

Acute abdominal pain is severe pain of insidious or sudden onset necessitating urgent investigations and treatment. Although not always surgical, the presence of abdominal pain should always put the surgeon on alert as delayed intervention could lead to a catastrophic outcome. In order to improve the clinical accuracy of our diagnosis, I have made the study of acute abdominal condition in children a primary focus. Our findings have elucidated that certain abdominal conditions hitherto regarded as uncommon in African children are on the increase. For example, we found that Acute appendicitis hitherto regarded as a preclude of Caucasian children is becoming more frequent. We discovered that although it accounted for 0.43% of all paediatric admission in our hospital, it represented 18% of all pediatric abdominal emergencies. We also observed the increased morbidity among these children which we attributed to late presentation and delayed diagnosis. Recommendations have been made on improving the diagnosis and treatment of acute appendicitis in our children

The pattern of a disease condition in an environment influences the awareness of doctors to the presence of such disease and hence diagnosis and management becomes easier within the limit of available resources. In 1989, we set out to study the pattern of intestinal obstruction among our children. We discovered that in contrast to what obtained in Europe and North America, intestinal obstruction was a commoner cause of acute abdominal pain in contrast to acute appendicitis in Caucasian children_(Adejuyigbe and Fashakin, 1989). We also studied a special form of intestinal obstruction which occurs in younger children called Intussusception. This is a condition in which a segment of the intestine telescope into an adjacent segment thereby causing obstruction. Our findings led to conclude that this is the commonest cause of intestinal obstruction in our children and that it is confined mainly to infancy in our environment in contrast to what is recorded in the English literature. We have made recommendation on improving the diagnosis and outcome of this condition in our environment within the available

resources. We also postulated that slavish adoption of western diets as complimentary feeds to our children might not be unconnected with the pattern observed_(Adejuyigbe, Jeje *et al.* 1991)_It is also worth while to note that the first reported familial occurrence of this condition in Nigeria and probably in Africa was reported by us in 2004(Adejuyigbe, Sowande, Eziyi 2004).

Peadiatric Trauma

In most western countries, trauma has reached epidemic proportion. In the United States of America, injury is the leading cause of death among children and adolescents under 15 years and trauma accounted for 20,000 deaths every year (Beaver BL and Haller JA) .Therefore provision of facilities and resources for trauma care is a major priority in those countries. Bickler and Rode, 2002 had observed that childhood surgical conditions especially injuries are common in developing countries and that poor care results in significant numbers of death and cases of disability. In Nigeria, the significance of trauma as a cause of mortality and morbidity is yet to be recognized and given the appropriate attention . Our unit is one of the few units in Nigeria that had observed that trauma is gradually assuming a prominent role in childhood morbidity and mortality in our country. We have especially focused on the pattern of abdominal trauma in Nigerian Children. Road traffic accidents are responsible for over 80% of abdominal injuries in children in our center. We observed that the most commonly injured Intraabdominal organs are the spleen and the liver_(Adejuyigbe, Aderounmu *et al.* 1992). The current trend in the management of these injuries in most centers abroad is non surgical. We have shown that this is also possible in our children if trained personnel and adequate facilities are available. Penetrating missile injuries is becoming more frequent in Caucasian children and with increasing sophistication of our society, this may be the trend among our children in the future. Suffice to say that we conducted our study on abdominal injuries at a time when a popular television series ARELU was being aired in the South Western Nigeria. In a situation of life imitating art, though in this circumstances with dare consequences, we found some children

inflicting injuries on their siblings with their fathers Dane guns while attempting to mimic the role of FADEYI OLORO, one of the major characters in the series.

The Fight against Surgical Infections

Bacteria have been with man since antiquity. As man is evolving, so also are these organisms evolving with development of resistance against many known potent antibiotics. In man, bacteria are responsible for significant morbidity and mortality. In many instances, the definitive management of the consequences of their infection is left to the surgeon. I have had special interest in defining the pattern, aetiology, manifestation diagnosis and management of these conditions since my early days in residency training. Through collaborative studies, we have characterized the various factors that influence the pattern of these diseases and the outcome of the surgical management.

In Empyema thoracis we were able to show that the ubiquitous staphylococcus's aureus was the commonest organism involved in the infection. (Adeyemo, Adejuyigbe *et al.* 1984)_ Also, we have determined the pattern of aerobic and anaerobic bacteria involved in childhood intra-abdominal sepsis. Our study has shown that the majority of these organisms are sensitive to the antibiotics currently available in this country. Some of these antibiotics such as Gentamicin are still relatively cheap. (Ako-Nai, Adejuyigbe *et al.* 1990)_

Our study on intra-abdominal abscesses in children showed that majority are due to perforations of hollow viscus. And that these are best managed by open surgery. This situation has not changed today. We were also able to relate poor outcome in these children to high fever on admission, a positive blood culture, sub-phrenic location of abscess, association with typhoid perforations, organ impairment and multiple organ failure in the patients (Adejuyigbe O, Jeje *et al.* 1995)_ We hope this knowledge will stimulate a more determined and innovative approach to caring for these children.

In the days when ultrasound was not universally available, we also compared the efficacy of this then new investigative technique with the traditional plain abdominal X rays in the investigation of

intraabdominal abscesses and we found ultrasound to be superior. Ultrasound is currently the investigation of choice in the diagnosis of this condition worldwide.

Antibiotics play a vital role in the surgical management of these conditions. Apart from cost and availability, toxicity is a major consideration in the use of such drugs. As far back as 1982 me and my colleagues at the Department of Paediatric Surgery at the Sophia Children's Hospital in Rotterdam, The Netherlands investigated the mechanism for the clinical observations that children tolerate aminoglycosides better than adults. This involved conducting an experimental study with rats. We were able to show that indeed young rats tolerated aminoglycosides better than adult rats and this was due principally to reduced accumulation of the drugs in the renal tissue of the young rats. We postulated that this was the mechanism for the clinical observation in (Provost, Van Schalkwijk *et al.* 1984; Provoost, Adejuyigbe *et al.* 1985)

Congenital Malformations

It is a recognized fact that the major workload of any paediatric surgeon is made up of children with congenital malformations. This also hold true for me. While many of these lesions are obvious even to the untrained eye, many of them create diagnostic dilemma and serious challenges to the surgeon. Although the aetiology of many of these conditions are still unknown, we have made efforts in defining the various ways in which congenital malformations are encountered in our practice and the challenges we encountered in their management and how these children can have a fulfilling life.

We have been able to contribute to the expanding literature on these conditions worldwide and Nigeria in particular. We have also been able to draw attention to the possible aetiology and pathogenesis as well as the natural history of some of the conditions. For example, we documented a co-existing absence of the rectus abdominis muscle in a patient with Gastric duplication which was hitherto unreported. (Adejuyigbe O, Hamed A D *et al.* 1988; Adejuyigbe, Olayinka, Sowande *et al.* 2002). We have also drawn attention to cervical teratoma in children as a possible cause of respiratory obstruction in infancy and we have defined the plain radiographic and

ultrasonographic features of these congenital tumours (Adejuyigbe and Odesanmi 1989).

We have been able to provide one of the few clinical evidences in support of the theory that strangulation obstruction or ischemia of the bowel in utero would progress to intestinal atresia according to the experimental work of Louw (1952,1956,1959) This was in a baby who had Intussusception while in the womb and we demonstrated that the resulting atresia that necessitated his abdominal operation about 48 hours after birth was due to the strangulating obstruction consequent on the intussusceptions (Adejuyigbe and Odesanmi 1990). (Fig 13).

We have also been able to show that contrary to reports which tend to indicate that mesenteric and omental cysts were rare in the black race, the incidence of these lesions in children presenting to our hospital is similar to those reported for Caucasians (Adejuyigbe, Lawal *et al.* 1990)_. Majority of omental and mesenteric cysts seen in the children presenting to us were congenital lympangiomatous cysts. While some of these may present as causes of abdominal emergencies, others will present as just causes of progressive abdominal swelling. Such abdominal swellings may reach massive proportions

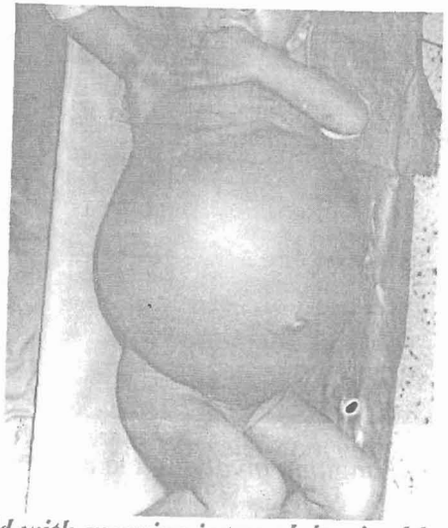


Fig. 9: A child with massive intra-abdominal lymphangioma

(Figure 9) but our experience is that the children usually do well if surgical intervention is carried out before the onset of complications. Congenital lympangiomatous cysts also occur elsewhere in the body. The most common site in our experience as well as that of other surgeons is the neck

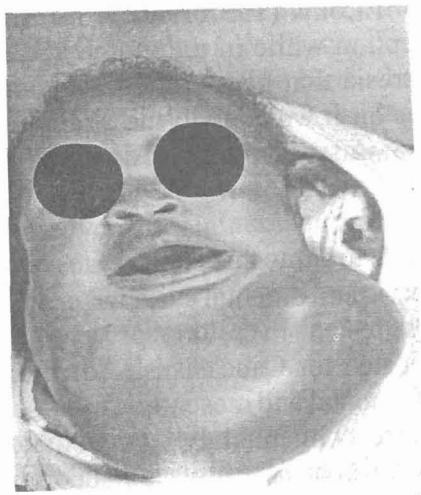


Fig. 10: Cystic Hygroma in a New born

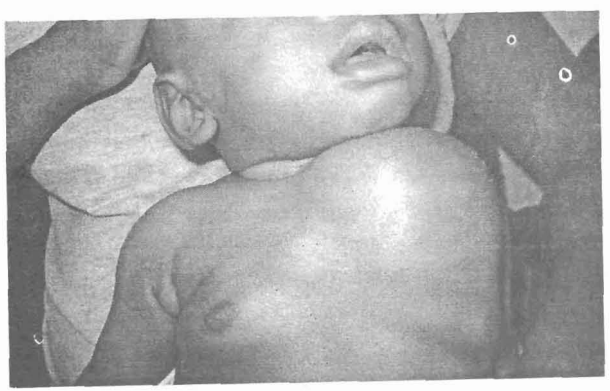
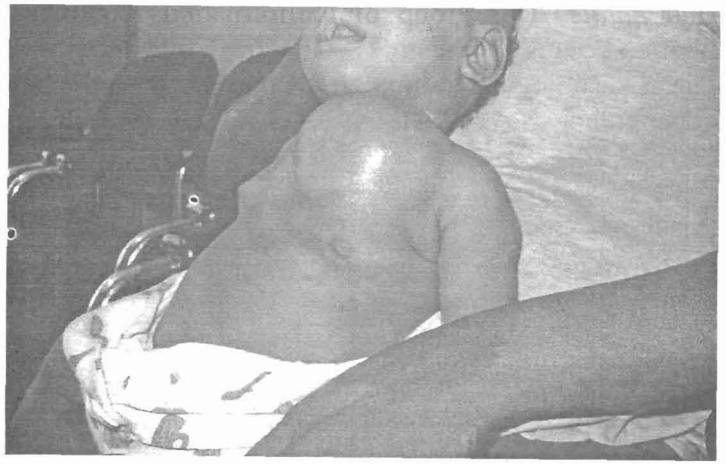


Fig. 11: Cystic lymphangiona involving the chest wall in an infant



(Figure 10,11&12). since these are usually very evident at birth and could be cosmetically embarrassing to the parents the children present early for treatment. This is just as well since these tumours are not innocuous but could be the cause of life threatening respiratory obstruction as was the situation with some of our patients. (Figure 13)

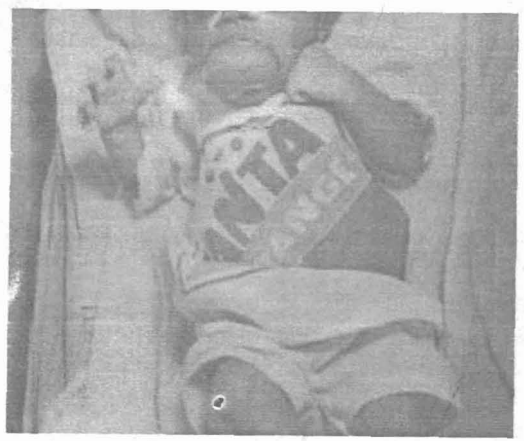


Figure 13 lymphangionia involving the tongue causing difficulty with breathing and feeding.

Another common and very obvious congenital anomaly that has attracted the attention of my colleagues and I has been *cleft lip with or*

without cleft palate. This group of malformations continues to receive attention because of the gross cosmetic deformity as well as the social and psychological trauma on the parents when the babies are still young and on the babies themselves if corrective surgery is delayed. (Figures 14 – 17)

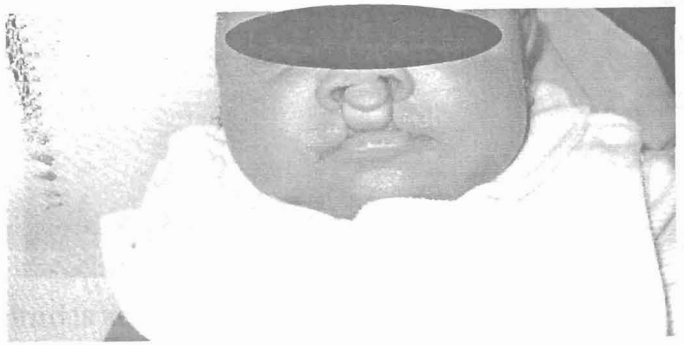


Figure 14 Bilateral Cleft lip and Palate: Preoperative Appearance

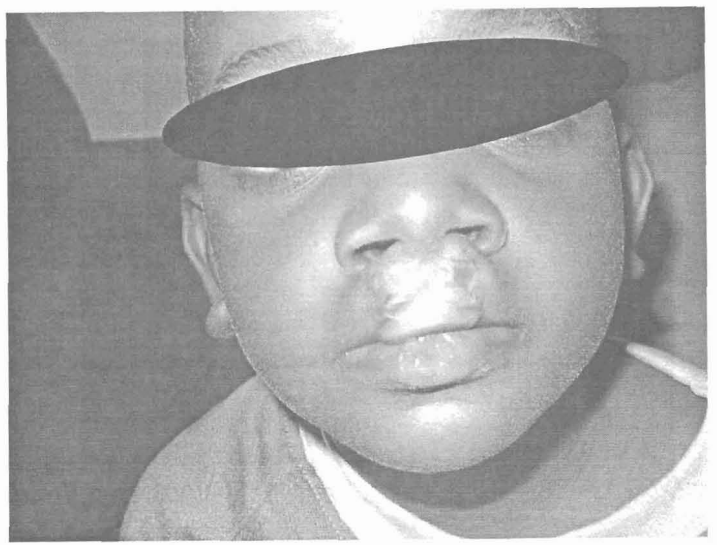


Fig. 15 Bilateral Cleft lip and Polate - Postoperative appearance

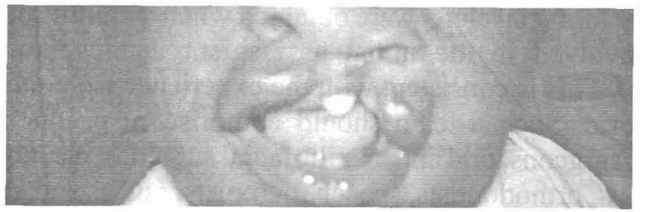


Fig. 16 Unilateral cleft lip and alveolus Preoperative appearance

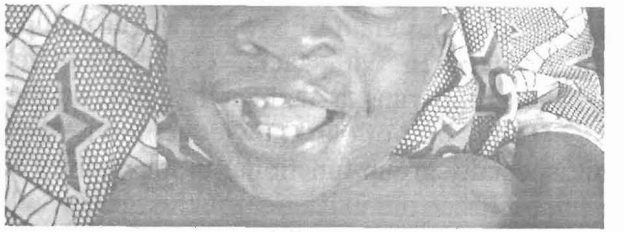


Fig. 17: Unilateral cleft lip and alveolus - Post operative appearance

We have studied children with facial clefts seen by us in the Teaching Hospital in Ile-Ife and our results showed that isolated cleft lip seen in 63% of the children is the most common anomaly and this is commoner in girls. (Ugboko V O, Owotade F, Adejuyigbe O *et al.* 1997). Cleft lip combined with cleft palate was seen in a third of the patients and is commoner in boys, while cleft palate alone was found in 3.5% of patients and only in girls. However, when all facial clefts were pooled, there was no statistically significant gender difference. All the children with cleft lip combined with cleft palate usually have the lip defect repaired first but only very small minority come back for the repair of the palatal defect. We suspect that this is due to the fact that the palatal defect being hidden was not considered a major problem by the parents once the embarrassing lip defect has been taken care of. Unfortunately such neglected palatal defects will cause future speech and probably hearing impediments in the children.
Our experience in Ife has shown that the best results after corrective

surgery for facial clefts were obtained when a multidisciplinary team was involved in the initial assessment and eventual corrective surgery. This is consistent with the experience from other centres in the world. Such a team should comprise of paediatric surgeons, plastic surgeons, oral and maxillofacial surgeons, ear, nose and throat surgeons, orthodontists, speech therapists, nurses and general dental practitioners. This realization led my colleagues and I in the specialties to come together to form the *Ife Facial Ceft Management Group in 2001.* The group has recently established a patnership with the SmileTrain orgaanization in the United States of America on improving the care of these patients. This partnership has resulted in the award of an initial grant of $15000 to our group in Ife for free treatment of children with facial clefts. The Ife Facial Cleft Management group runs a dedicated clinic at the IHU of the OAUTHC. To the best of our knowledge, the Ife group is the only such multispecialty group functional in the country at the moment. We are hopeful that the existence of this group will improve the quality of care and life of children with facial clefts seen in our hospital.

Newborn (Neonatal) Intestinal Obstruction

Most cases of neonatal intestinal obstruction are secondary to congenital lesions of the bowel. These include atresia of the duodenum and the small bowels, Hirschsprung's disease and anorectal malformations. Many of these have pathognomonic features that make diagnosis fairly easy and straightforward. This is however not the case with another major cause of intestinal obstruction in children as seen in our practice here at the OAUTHC. This condition is *intestinal malrotation*. Intestinal malrotation arises because of an arrest in the normal embryological process that results in the intestines being disposed within the abdomen in the normal pattern.

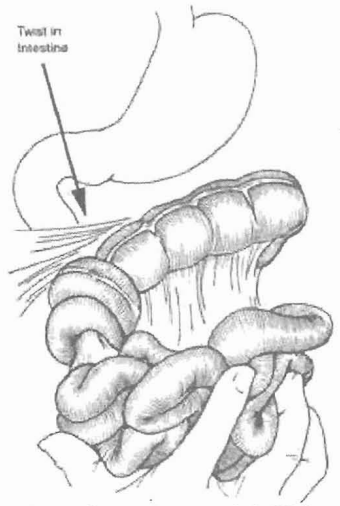


Figure 18: Intestinal Malrotation with Volvulus (twisting of the bowel)

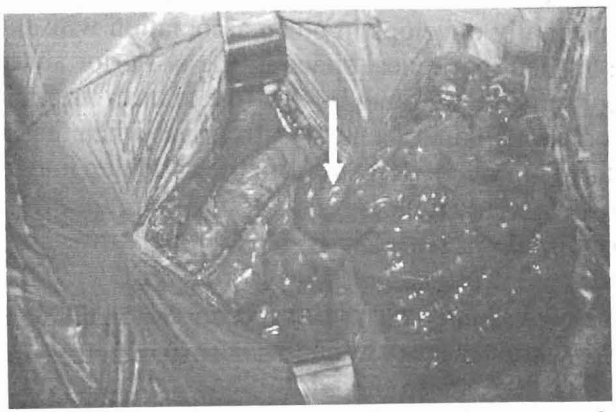


Fig. 19 Intestinal Malrotation with volvulus (twisting of the bowel)

Because of the complexity of the embryologic process involved, a wide array of possible anomalies can result from errors of intestinal rotation. This also has resulted in a great variation in the pattern of clinical manifestations. Usually, clinical problems are due to intestinal obstruction from a volvulus, bands or internal hernias. (Figures 18, 19) Based on our clinical experience, we found that cases of intestinal malrotation were being mistreated due to a misdiagnosis.

surgery for facial clefts were obtained when a multidisciplinary team was involved in the initial assessment and eventual corrective surgery. This is consistent with the experience from other centres in the world. Such a team should comprise of paediatric surgeons, plastic surgeons, oral and maxillofacial surgeons, ear, nose and throat surgeons, orthodontists, speech therapists, nurses and general dental practitioners. This realization led my colleagues and I in the specialties to come together to form the *Ife Facial Ceft Management Group in 2001*. The group has recently established a patnership with the SmileTrain orgaanization in the United States of America on improving the care of these patients. This partnership has resulted in the award of an initial grant of $15000 to our group in Ife for free treatment of children with facial clefts. The Ife Facial Cleft Management group runs a dedicated clinic at the IHU of the OAUTHC. To the best of our knowledge, the Ife group is the only such multispecialty group functional in the country at the moment. We are hopeful that the existence of this group will improve the quality of care and life of children with facial clefts seen in our hospital.

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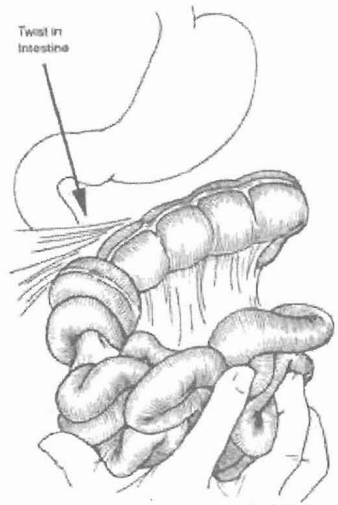

Figure 18: Intestinal Malrotation with Volvulus (twisting of the bowel)

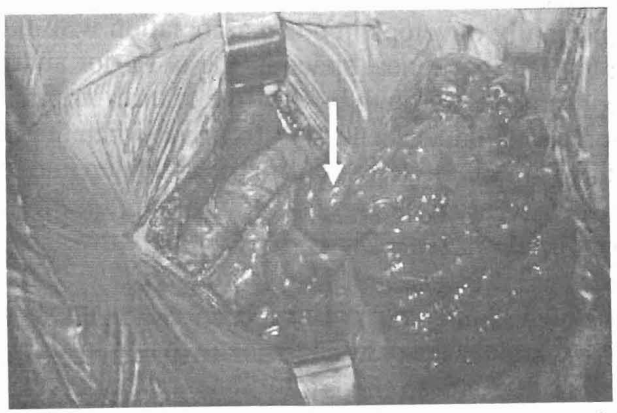

Fig. 19 Intestinal Malrotation with volvulus (twisting of the bowel)

Because of the complexity of the embryologic process involved, a wide array of possible anomalies can result from errors of intestinal rotation. This also has resulted in a great variation in the pattern of clinical manifestations. Usually, clinical problems are due to intestinal obstruction from a volvulus, bands or internal hernias. (Figures 18, 19) Based on our clinical experience, we found that cases of intestinal malrotation were being mistreated due to a misdiagnosis.

We therefore described the constellation of symptoms that should arouse a suspicion of the diagnosis of intestinal malrotation in children. These are recurrent colicky abdominal pain which is usually centrally located, intermittent vomiting, on and off constipation, and failure to thrive. A recurring problem in our experience as well as those of others relate to the inability to initiate parenteral nutritional and cardio respiratory support in needy children particularly after they have had a substantial proportion of their intestine resected at the operation due to gangrene. We have identified these as well as health education of the public to prevent late presentation in hospital as areas that require corrective action (Adejuyigbe O, Bashorun A.A *et al.* 1992)_.

Testicular maldescent resulting in the absence of one or both testes from the scrotum is one of the most common congenital malformations encountered in males. This anomaly arises because the testis normally develops in close association with the primitive kidney in the retroperitoneal space in the posterior abdominal wall and descends into the scrotum by the time of birth in a full term baby. The phenomenon of undescended testis arises when there is an arrest of the testis in its path of descent from the abdomen into the scrotum. *Whatever may be the aetiology, an empty scrotum in a boy causes much anxiety in the parents and creates problems with self awareness in children or adult patients especially with regard to sexual capability and ipso facto the ability to procreate.* This is more so that the complications that may attend a testis that is located outside the scrotum include torsion, testicular trauma and malignant degeneration. It is also established that spermatogenesis is impaired in the undescended testis. Studies from North America have shown that the incidence of undescended testis varies from 4.2% in neonates to 0.44% in older children and adults. Up till the time we got interested in the subject there had never been a study on the frequency of undescended testis in Nigerian neonates and children. Earlier reports on the subject in the country had emphasized the presentation, complications and management of undescended testis. In 1990, my colleagues and I started a study to determine the incidence of

undescended testis in Nigerian newborns. We examined 1840 newborn boys delivered at the OAUTHC, a community health centre and some private hospitals in Ile- Ife. The babies found to have undescended testis were then followed up for a period of 12 months to determine the natural history of this anomaly in Nigerian boys. Of the 1840 newborn males studied, 1486 (80.8%) were full term while 354 (19.2%) were preterm. The frequency of testicular maldescent at birth and the clinical course over the 12 month period of follow up are shown in Tables I and II.

Table 1
Occurrence of Undescended Test in Relation to gestational Age of Newborn babies in Ile-Ife.

Gestational Age	No. of Neonates	No. with Undescent (%)
<28 weeks	13	7(53.8%)
28-32 weeks	85	41(48.2%)
32-38 weeks	304	49(16.1%)
38-42 weeks	1438	63(4.4%)
Total	**1840**	**160(8.7%)**

Our study showed that the incidence of undescended testis ranges between 4.4% in the full term infant and 53.8% in the premature infants. Statistical analysis of the figures showed a correlation between gestational age and the frequency of testicular maldescent. Most of the babies with undescended testes at birth in our series had the testes descended into the scrotum by 4 weeks postnatal age Table II.

Table II

Pattern of Testicular Undescent in Neonates with Crytorchidism over a Follow-up Period of 12 months in Ile-Ife.

Gestational Age (Weeks)	*No. with Tests Undescended*	*Time of Descent (Wks)*		*No. Undersended at end*		
1	2	3		8		
<28 weeks	7	-	-	3	-	*
28-32 weeks	41	2	10	15	6	*
32-38 weeks	49	7	16	17	2	2*
38-42 weeks	63	25	9	8	9	5
Total	160	34	35	43	17	7

**Some babies in these groups died before completion of study.*

We found that any testis that was not descended into the scrotum by 8 weeks was also not descended by one year. Based on our findings, we advise that medical practitioners and parents should not be unduly distressed if a boy does not have the testis in the scrotum at birth since majority of such undescended testes will descend spontaneously over a few weeks. But any testis that is still outside the scrotum by the age of one year should be referred for the corrective surgical operation to bring it down into the scrotum and fix it there since it is unlikely that such a testis will come down into the scrotum spontaneously. (Agbakwuru EA, Adejuyigbe O et al. 1995).

Congenital Diaphragmatic Hernia

The diaphragm is a musculo-tendinous sheet that separates the abdominal from the thoracic cavity.

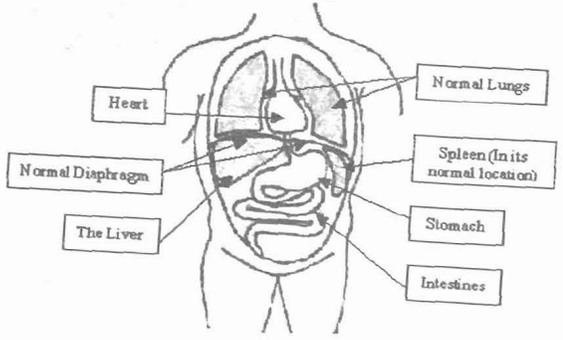

Fig. 20: Normal Anatomical Relationship of the Diaphram to Thoracic and Intra-Abdominal Organs.

It is derived from many sources between the 4th and 9th week of embryonic life. I do not intend to recount its complex embryogenesis in this lecture to avoid boring you. Suffice it to say that the fact of its multiplicity of origin makes the presence of congenital malformations not uncommon. The most common and highly fatal is called congenital diaphragmatic hernia. This is because the intestines may herniate through any subsisting defect in the diaphragm into the thoracic cavity. With subsequent growth of the intestines that may have herniated into the thoracic cavity, the developing lung buds will be compressed and the abdominal cavity loses much of the stimulus to continue to enlarge. Moreover, the normal rotation and fixation of the bowel loops in the abdomen will not be completed

The underdevelopment of the lungs that usually accompanies the presence of a congenital diaphragmatic hernia is responsible for the acute respiratory distress which is the main clinical feature of this condition at birth. It has been established that survival of a baby with congenital diaphragmatic hernia is dependent on the ability of the lungs to maintain a life sustaining capacity for gaseous exchange that permits adequate oxygenation of the blood. The current surgical management of congenital diaphragmatic hernia involves a period of preoperative stabilization with assisted ventilation and other manouvers to reduce the attendant pulmonary hypertension and other disturbances of cardio-respiratory function. It is when these have been accomplished that surgery is now advised. We however do not have facilities for assisted ventilation. Many of the babies we see in our practice are those whose lungs have developed to a stage where life can be sustained without recourse to assisted ventilation (Adejuyigbe, Abubakar & Sowande 1998). These babies have done well after surgery. In many instances the babies were not even suspected to have congenital diaphragmatic hernia until an illness brings them to hospital and a diagnostic workup reveals the diaphragmatic hernia that must have been present since intrauterine life.

The problems attendant to the compression of the developing lung buds in-utero by a congenital diaphragmatic hernia is not usually

completely resolved by postnatal surgery. Consequently, even where the hernia has been reduced and the diaphragmatic defects closed, the children may continue to experience respiratory problems postoperatively. The continuing postoperative respiratory complication is the major stimulus for the move in a few selected centres to correct diaphragmatic hernias in-utero by operating on the foetus. The underlying principle is that if the hernia is reduced while the baby is still in the womb, the nascent lung buds will develop and mature normally. Nigeria is still very far from supporting a foetal surgery programme because the supporting infrastructure is not yet available. From the above, it will be evident that the status of the cardio-respiratory systems before and after surgery for congenital diaphragmatic hernias has received and will continue to receive attention. In contrast, there have been only a few studies of the anatomical and functional status of the gastrointestinal tract in survivors after repair of congenital diaphragmatic hernia (CDH). In an effort to contribute to the body of knowledge on the causes of gastrointestinal dysfunction in survivors of surgery for congenital diaphragmatic hernias we studied, postoperative feeding difficulties in 64 survivors treated at the Birmingham Children's Hospital in the UK over 10 year period. Twenty four (37.5%) of the 64 survivors had postoperative feeding difficulties due to a variety of causes. These include Gastro-oesophageal reflux, recurrent diaphragmatic hernias, adhesive intestinal obstruction, gut motility disorders and campylobacter enteritis. In the majority of these children, the feeding problems ceased when the identified underlying anomaly was corrected. In 6 of the 24 children no structural anomaly could be found post operatively to account for the feeding difficulty. We considered it noteworthy that in 3 of these children, an intestinal malrotation had been found and corrected at the initial surgery to repair the CDH. It is our view that the initial malrotation might have been responsible for the subsequent feeding problems as poor GIT function postoperatively had been found to complicate correction of intestinal malrotation. (O Adejuyigbe, RG Buick, P Gornal , JJ Corkery 2004) The combination of persisting respiratory problems as well as feeding difficulties after correction of CDH may explain why some of the children experience poor growth in childhood. It is

therefore mandatory that extra attention must be paid to such children in the postoperative follow up period if they must grow to the fullness of their potential and enjoy life to the full.

The Child without Anus (Anorectal Malformations)

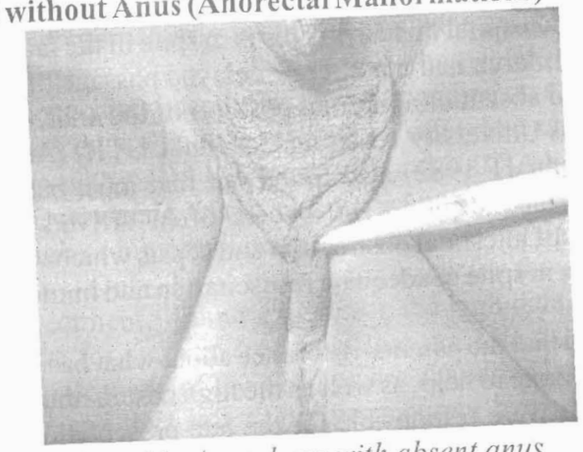

Fig. 21: A newborn with absent anus

"A properly functioning anus and rectum is an unappreciated gift of the greatest prize" (Potts, 1959). The ability of a newborn to defaecate and urinate has been taken for granted in Yoruba culture. For when one buys a new dress one of the greetings/prayers is *Omo a su si, omo a to si*. This greeting literally translates to that may your baby soil this dress with her faeces and urine. While this greeting's / prayer's intent is wishing that the owner of the dress would have and carry babies of his/her own, it presupposes that such babies will defaecate and urinate normally. Unfortunately, not all newborns can defaecate normally for a variety of reasons. About 1% of babies seen in our practice come because they have congenital anomalies of the anus and rectum which interfere with the normal functioning of the anus. These anomalies may be due to absence or abnormal positioning of the anus and rectum (Figure 21). These anomalies are collectively known as Anorectal Malformations (ARM). In many centres in the country, this is the commonest cause of intestinal obstruction in the newborn. Ordinarily the absence or abnormal

position of the anus should be obvious enough to allow detection in the delivery room and allow early presentation for definitive treatment. However our experience shows that this is usually not the case. In our study of ARM at Ile-Ife, we discovered that age at presentation for treatment ranged varied from 1 day to 15 years with a median age of presentation to hospital of 3 days. This is in spite of the fact that about two thirds of the children had inability or delayed passage of meconium and about 75% had absent or abnormal position of the anus. A similar study from the Lagos University Teaching Hospital LUTH) (Adeyemi S D and da Rocha-Afodu JT 1982) also found out that most babies with ARM came late to the hospital. The babies often arrived with advanced complications of intestinal obstruction and sepsis which were responsible for their deaths in spite of adequate resuscitation and immediate anoplasty or colostomy.

We discovered that the parents' ignorance about what has gone wrong and what could be done to help as well as the high cost of obtaining treatment in the hospitals were responsible for the late presentation. ARM can be divided into three groups, the low, intermediate and high depending on how far the bowel terminates from the anal sphincter.

About 30% 0f children seen in our centre have the easily managed low form of ARM and the treatment period is usually short and compliance is high. In the intermediate and high anomalies, the remnant of the anus and rectum are yet to pass through the controlling sphincter mechanism. Such anomalies usually treated with surgical procedures carried out in two or three stages to ensure a satisfactory outcome particularly in relation to faecal continence. About 70% of the children presenting in our centre were in this category. Usually, the first stage involves the establishment of a diverting colostomy to overcome the problems of the intestinal obstruction that usually accompany ARM and so allow the baby to thrive. The second stage is carried out at a varying period of 4-12 months when a new anus will be created. Over the years, we have gradually brought down the age at which we perform the operation for this stage. At the beginning, we used to operate on the children at about the age of one year for this stage but now, we carry out the operation at about 4 -5 months if the children have grown well. Since 1993 we have introduced the innovative technique of posterior saggital anorectoplasty (PSARP) _ (deVries and Pena, 1982) which allows complete reconstruction of the whole spectrum

of ARM through a midline trans-natal cleft incision without compromise to anorectal function. So far the results have been good. The last stage involves closure of the colostomy established when the baby first presented.(Figure) From the forgoing it is obvious that the parents of a child with ARM need a lot of commitment to see the treatment through particularly for the intermediate and high lesions. Unfortunately many of the parents in our environment do not possess such commitment either because it is too demanding on their time or resources or they do not believe in what we offer their children. We saw 86 children with ARM between 1986 and 2002(Adejuyigbe O, Abubakar AM, Sowande OA,et al 2004). Out of this number, 59 children had high or intermediate anomalies and were thus given an initial colostomy. Only 27 of them came back for the subsequent stages of the treatment. In our experience the high default rate is a common feature for surgical treatment that must be carried out in stages. We suspect many of the children are abandoned or not cared for as required and thus left to die prematurely because they are considered to be abnormal *ab initio* or are carrying colostomy (Sowande OA, Adejuyigbe O *et al.* 1999)

The tendency to abscond from treatment is illustrated by the case of a girl we saw when she was about 15 years old. This girl was referred to us because of cyclical abdominal pain that started 4 months previously. She was then taken to the gynaecology clinic from where she was referred to us because the gynaecologist could not see an anus in the usual position. It was assumed that she had been defaecating through an abnormal opening between her rectum and her vagina. When we examined the girl, she looked in every way like a normal girl. However examination under anaesthesia revealed that what was assumed to be the vagina was actually her anus and rectum that had migrated to occupy the normal position of the vagina. This was possible because the part of her vagina that should be in that position had not developed (Figures 22 & 23). It was then obvious to us that the cyclical pain she had been experiencing was due to the accumulation of blood that occurred during her menstruation that did not have a pathway to the outside. On further questioning of the mother, it turned out that this girl had been admitted as a case of ARM shortly after she had been born about 15 years earlier but when the

procedure had been explained the Mother claimed she became frightened and so discharged her daughter from the hospital particularly when she was passing stool normally albeit through was assumed to be "the vagina".

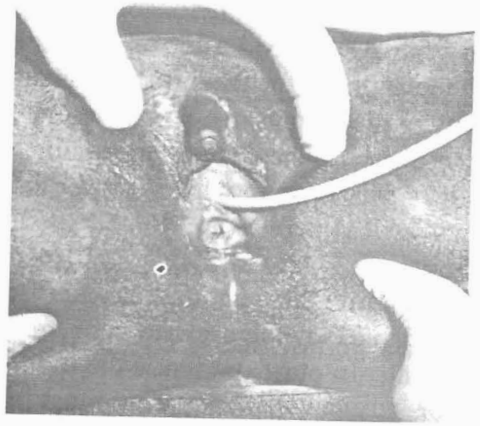

Figure 22: 15 Year-Old girl with absent vagina with translocation of the anus (occupying the area of the normal vagina)

How she expected the girl to live happily with the arrangement was a mystery to us. The girl who by this time was in secondary school subsequently had surgery which involved creation of an anus in the normal position and a reconstruction of the lower vagina

Fig. 23: During operative repair of the anomaly

After the corrective surgery, her main preoccupation was whether she will be able to live a normal life particularly whether she will have a normal sexual life and become a mother. Despite our reassurances or perhaps because of them she went to "try herself out" and so became pregnant before finishing secondary school !! She did not mind the interruption of her education in that at least she had proven that she could lead a normal and full life!! This girl illustrates in a beautiful way the theme of this lecture which is that our patients are not concerned with just anatomical corrections only, but they want to live normal and fulfilling lives (Adejuyigbe, Sowande *et al.* 2002)

Abdominal Wall Defects

Abnormalities in the development of the anterior abdominal wall lead to a general category of defects that present dramatically at birth.

In gastroschisis, the baby is born with the bowel loops exposed to the atmosphere without any coverings whatsoever (Figures 24 & 25)

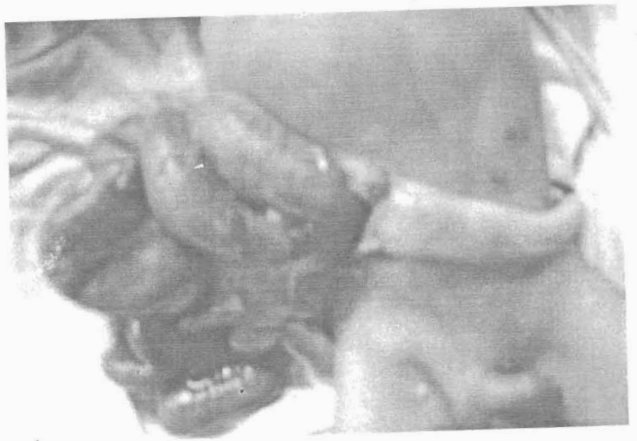

Figure 24: A new born with gastrosclusis (evisceration of the bowel from the right side of the umbilicus).

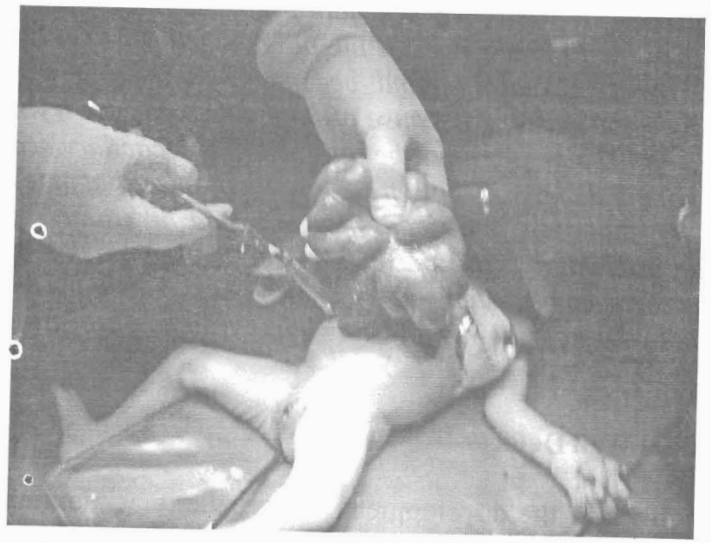

Fig. 25: Gastroschisis - Preoperative appearance

In exomphalos the abdominal viscera are covered by a thin transparent membrane that does not have the strength of the normal abdominal wall and consequently cannot offer the expected protection. (Figure 26)

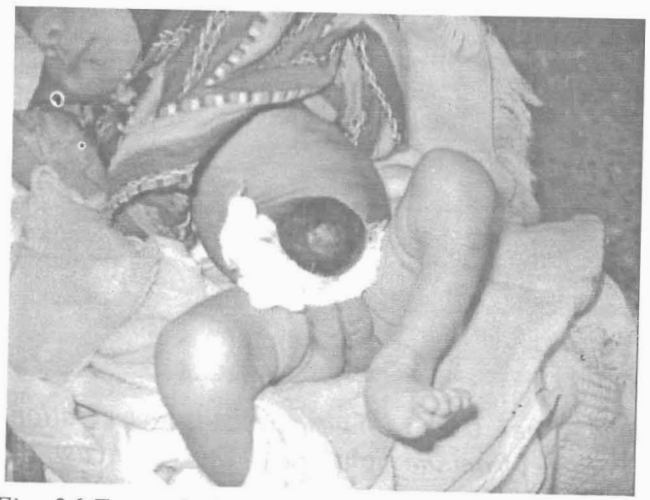

Fig. 26 Exomphalos - on conservative management

In both instances, the abnormalities are very obvious at birth. The treatment of these conditions is well standardized now.

In exomphalos, the options are between conservative and immediate operative treatment. In our unit at Ile-Ife, we treat very large exomphalos conservatively with the application of 70% alcohol until the transparent membranous covering is turned into a thick and tough eschar that will eventually separate from the underlying granulation tissue that would have formed (figures 27 & 28). After the eschar separates, the raw granulation tissue is dressed with sulphadiazine cream until the site eventually heals (figures 29 & 30). This treatment strategy lasts About 42 days and usually results in the formation of a residual ventral hernia that though compatible with life will still require surgical correction later.

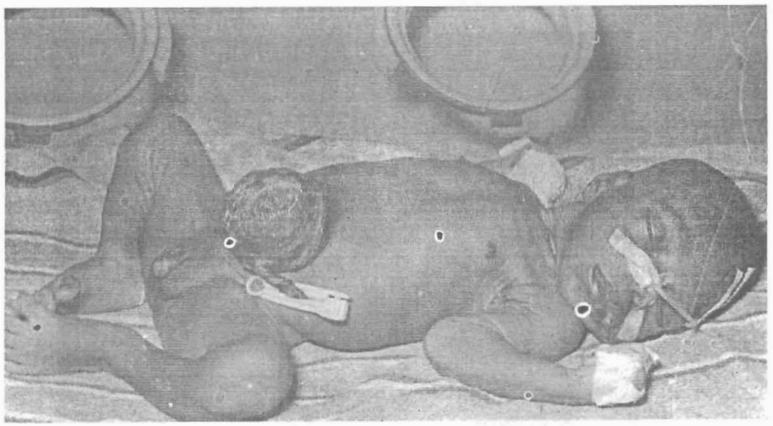

Fig. 27 Exomphalos On conservative management

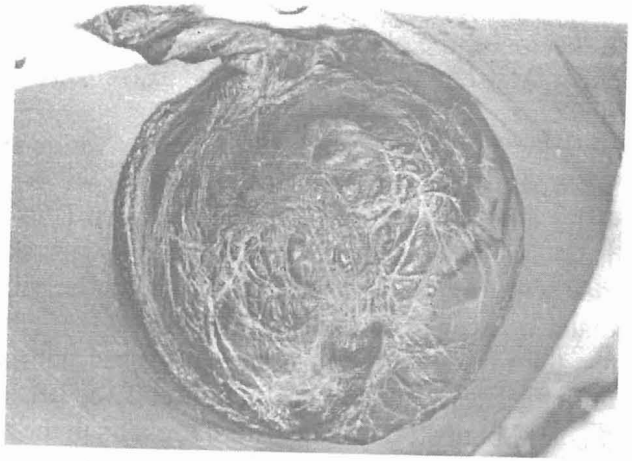

Fig. 28: Exomphalos closer view

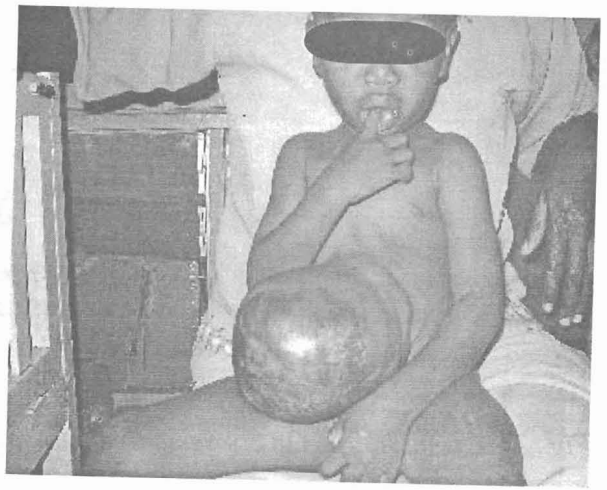

Fig. 29: 2 year old with Exomphalos successfully managed conservatively Awaiting final surgery

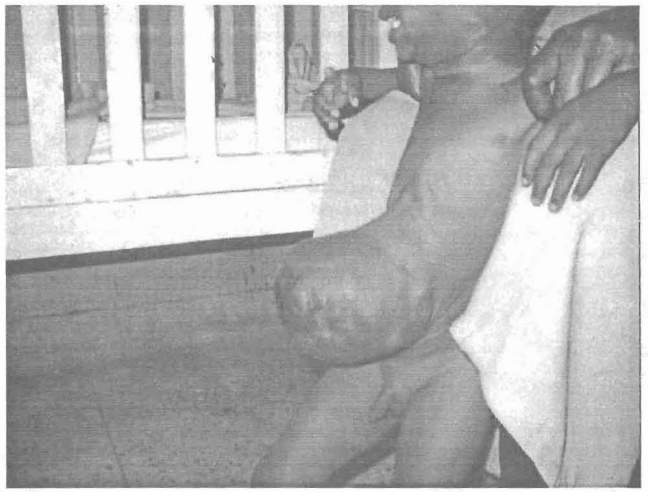

Fig. 30 Lateral View

The need for future surgery to correct a residual hernia and the possibility of rupture of the exomphalos sac while undergoing conservative treatment as well the ever present danger of infection had long ago stimulated paediatric surgeon to opt for immediate surgical correction of exomphalos. In very large exomphalos, it is not advisable that the abdominal viscera are reduced in a single step otherwise the crowding that may occur in the abdominal cavity may precipitate cardiopulmonary embarrassment to the baby as well as interfere with the blood circulation in the bowel loops. Consequently, the surgical procedure requires the creation of a silo to cover the viscera and this will be reduced gradually over a period of one week until all the viscera are in the abdomen (figures 31 & 32). The material recommended for the construction of this silo is silastic sheet because it relatively non irritant. Unfortunately, this is not readily available to us and on those occasions when we have had to operate in the immediate postnatal period on babies with large exomphalos either due to rupture of the sac or some other complication as well as in those babies with gastroschisis we have had to improvise with the collapsible bags of intravenous (IV) fluids with good results .

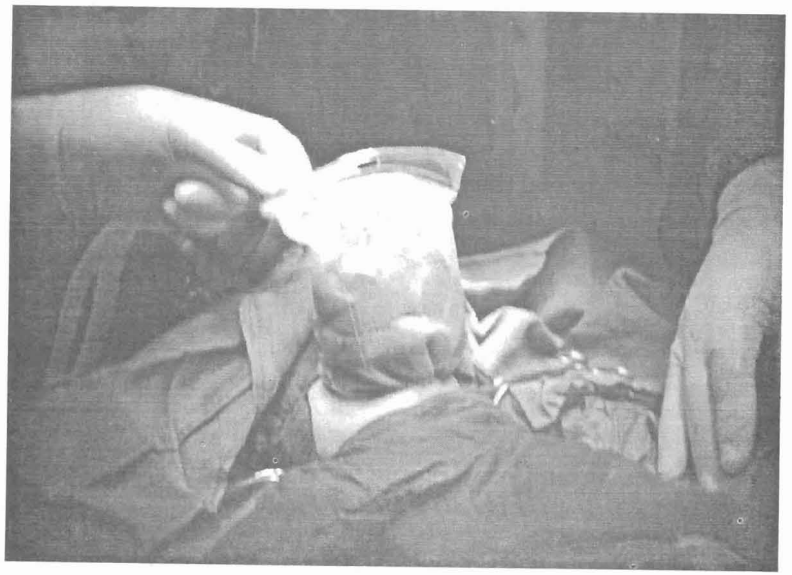

Fig. 31: Adapted Intravenous bag used as silo in the treatment of Gastroschisis and ruptured Exomphalos.

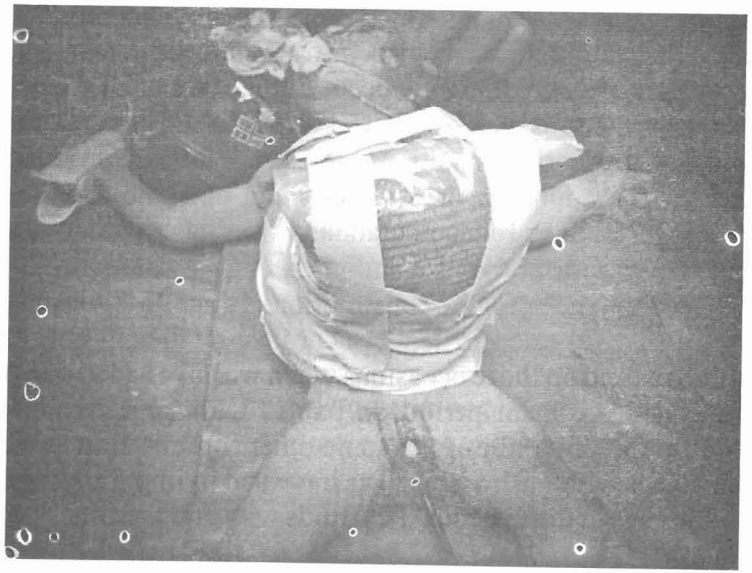

Fig. 32 Postoperative Appearance

Despite the modest success we have recorded in the management of these children we have encountered difficulties due to late presentation and also due to our inability to provide parenteral nutrition when it would have been beneficial to withhold oral feedings. One would have thought that with such gross and obvious anomalies like exomphalos babies would be brought to hospital early, unfortunately this has not been so in our experience. This delay in presentation as well as the unavailability of the required materials for therapeutic support has been the major cause of preventable deaths in these children.

Conjoined (Siamese) Twins

Of all congenital malformations there is none that excites health care professionals and lay men like conjoined twins. Though a set of conjoined twins occurs in about 1 in 50,000 conceptions the incidence may be higher as 28-54% of them die in the womb or are still born. The incidence is supposedly higher in Africans but this has been difficult to substantiate. This is due to the absence of population based studies since many births particularly stillbirths go unreported outside the hospital.

The result has been that the birth of a set of conjoined twins is still a media event all over the world. People all over the world are still fascinated by the birth of two babies joined together sometimes in grotesque ways! The recent case of the Akinbowale babies in Lagos Nigeria is a case in point.

To professionals and non professionals alike, the best known term for conjoined twins is Siamese Twins. This phrase was coined for Eng and Chang Bunker, the famous conjoined twins from Siam (now Thailand). They emigrated to the USA becoming naturalized citizens and earned their living in as a circus attraction. They became popular because they were involved in exhibitions in the USA and Europe. Scientists of that time argued over whether the brothers could be successfully separated, since the twins were joined at the chest by a thick band of tissue. They lived joined together for 63 years and married two sisters (Adelaide and Sarah Yates) in 1843 and fathered

21 children between them. Interestingly, 2 of their grand-daughters produced 2 normal sets of twins. They died a few hours after each other in 1874 after an extraordinarily eventful life.

Fig. 33 The original Siamese twins (Eng and Chang Bunker.)

Conjoined twins are formed when the developing embryo begins to split into identical twins but then stops part way leaving the partially separated egg to mature into a conjoined fetus. About 70% of these twins are females though majority of monozygotic twins are males. Why conjoined twins occur is currently unknown but genetic and environmental conditions may be responsible for the failure of twins to separate after the 13th day post fertilization.

Conjoined twins are classified according to the site of the most prominent conjunction. The suffix pagus which is derived from the Greek *pagos* meaning fastened together is used after the name of the anatomical site of joining. In addition to the above types there are other rare types of conjoined twins where the development of at least one twin had been hindered. Such rare types include Dicephalic twins (two heads, one body) (Figure 34)

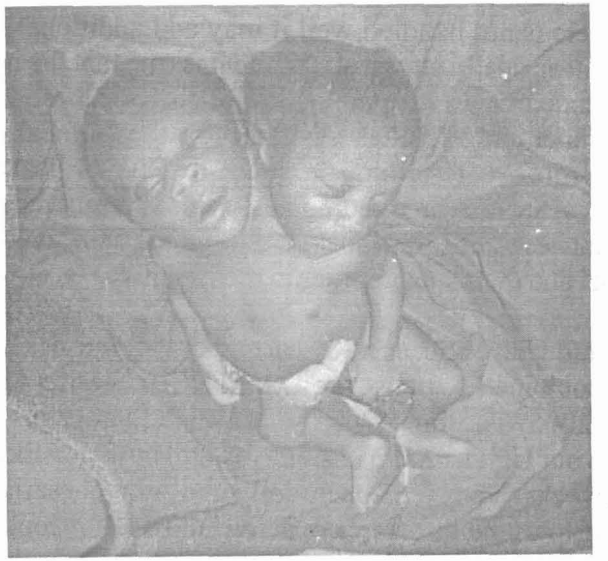

Figure 34: Dicephalic Twins (two heads, one body)

foetus in fetu (one malformed twin is buried within the other).

In these rare types of conjoining, separation usually involves the sacrifice of the malformed or parasitic twin.

The separation of conjoined twins is usually a multi disciplinary venture in view of the wide array of possibilities in organ sharing. Usually the paediatric surgeon because of his skill in managing babies and children coordinates the various specialists involved. The surgical procedure requires meticulous planning so that every member of the team would know ahead of time what would be expected of them and when they will be involved during the procedure. The theatre staff would know for example before the day of the procedure what special equipment may need to be provided and if there will be any alteration in the usual order of things depending on the anticipated actions in the theatre like the place photographers will stay etc. Also, the members of the team would know who among them will be dealing with media men for information dissemination and management because separation of conjoined twins attracts a lot of public curiosity as well as media attention and if interaction with

media practitioners is not handled well it may add additional stress to a situation that is intrinsically stressful. While it is true that the outcome of surgery is influenced greatly by the nature of the organs shared by the twins, the personnel and facilities available for the surgical procedure also play a major role in determining the success of the surgical operation. Successful surgical separation of conjoined twins is rarely reported from developing countries. This is probably due to the non availability of trained personnel and requisite facilities in most centres.

My colleagues and I have successfully carried out the surgical separation of two sets of conjoined twins at the OAUTHC in Ile-Ife(Adejuyigbe, Sowande *et al.* 2005) The first was a set of male Pygopagus conjoined twins referred to our Unit from a Mission Hospital in Ikole - Ekiti at about the age of six weeks. They had been delivered by a caesarian section. When they came to us the infants were active and healthy looking with a combined body weight of 3.35kgs.They were separated at the age of 4 months. (Figures 35 & 36)

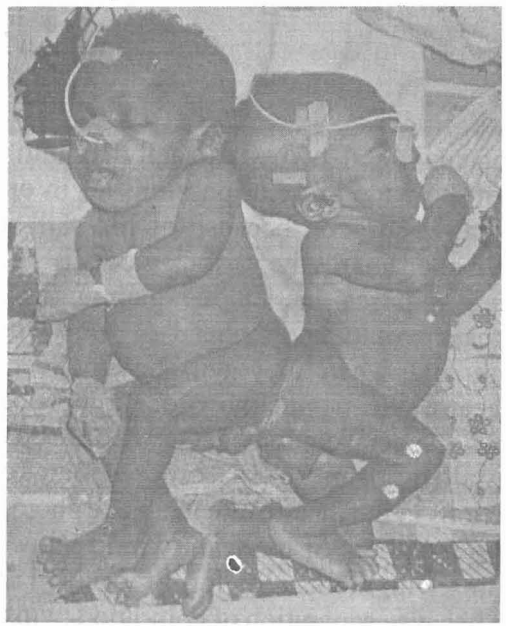

Fig. 35 Pygopagus twins (joined at the sacrum) -Preoperative appearance.

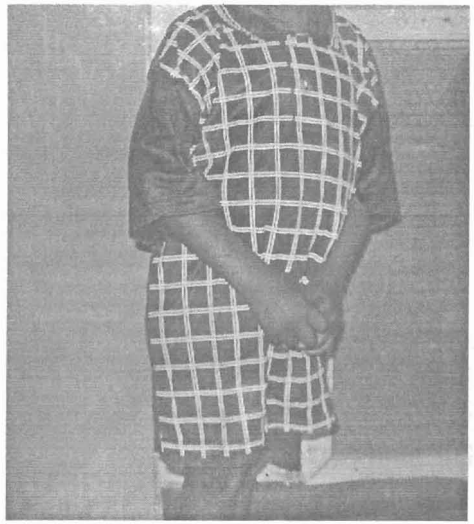

Fig. 36 One of the pygopagus twins (4 years after separation)

In this separation, the Orthopaedic, Plastic and the Neurosurgeons in our hospital also played a very significant role. The second set of twins was an Omphalopagus conjoined twins referred to us from a private hospital in Akure at the age of six hours (Figure 37)

Fig. 37 Omphalopagus Twins (joined at the abdomen)

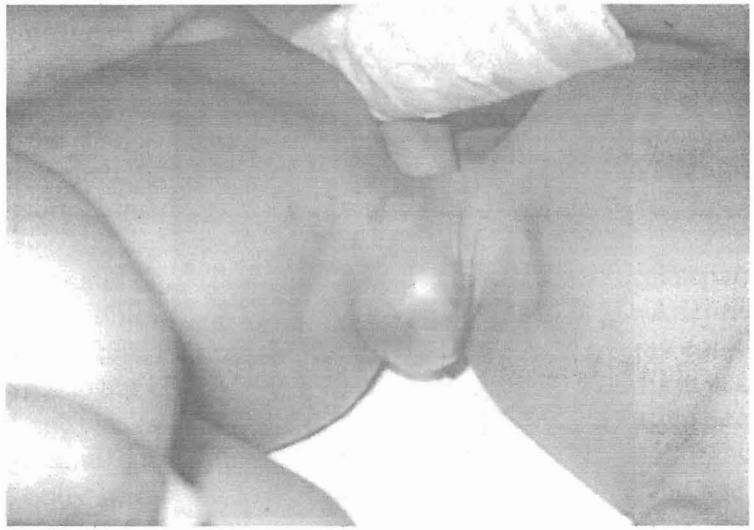

Fig. 38 Omphalopagus Twins joined at the abdomen)-Preoperative appearance

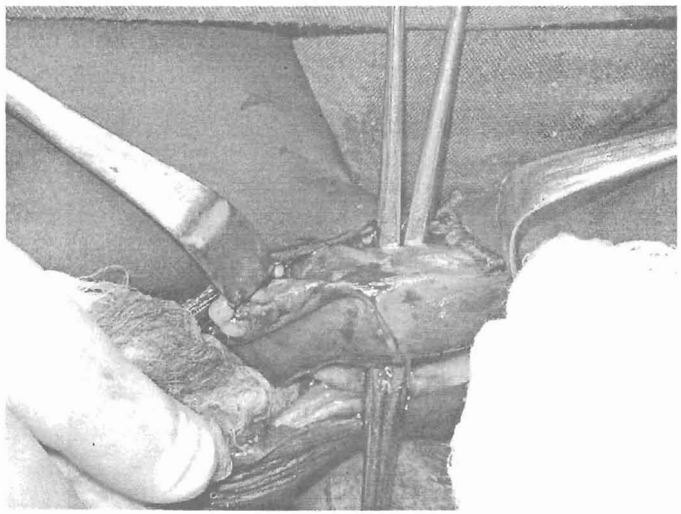

Fig. 39 Omphalopagus twins-intraoperative picture showing the shared liver

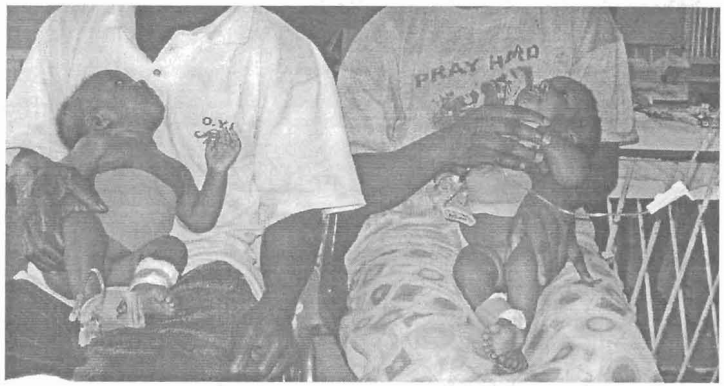

Fig. 40 - Post sepation of the omphalopagus twins - Happy babies, happy parents

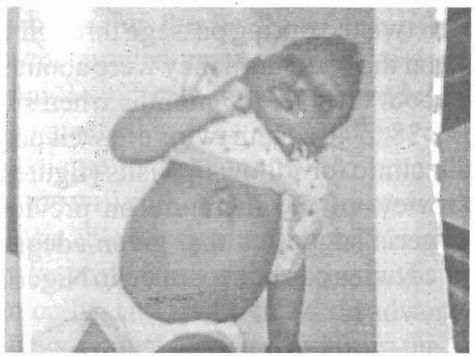

Fig. 4.1 First Twin - Post Separation at 6 month of age

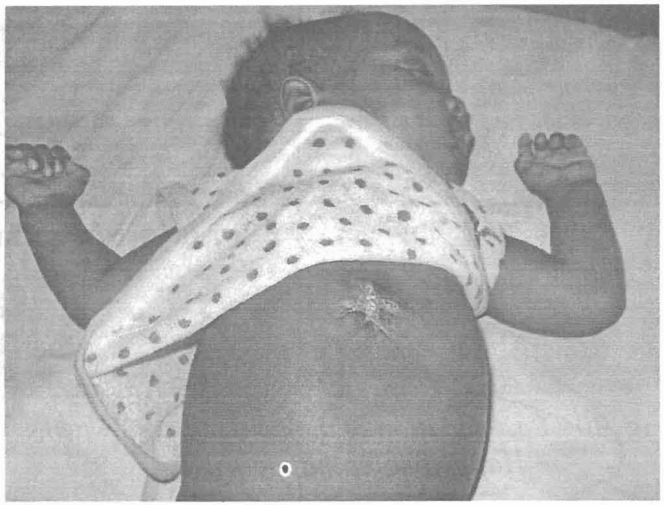

Fig. 42 Second Twin - Post separation at 6months of age

They were delivered by a 21- year old housewife by spontaneous vaginal delivery in a rather dramatic fashion in that one presented with the head, while the other presented with the feet. This meant that the region of fusion would have been twisted during passage through the mother's birth canal. They were kept on the ward until they were about 9 kg in combined weight which was at about the age of 5 months when surgical separation was carried out Figures 38 to 40). Both twins did well postoperatively and had been attending our clinic for follow up visits (figures 41 and 42). Our experience and the review of the literature on previous separation of conjoined twins in Nigeria suggested that given adequate facilities and support, many conjoined twins can be separated in Nigeria.

Quo Vadis...

Mr Vice Chancellor sir, during the course of this lecture, I have attempted to share with the distinguished audience my experience and passion in the practice of paediatric surgery over the past 25 years. When the progress being made and exploits recorded from centres in Europe and North America are considered alongside the modest achievements of surgeons in Nigeria, it is obvious that we are barely scratching the surface in

exploiting the ingenuity and resourcefulness of our surgeons. We are not under any illusion that all the children who require our services currently have access to the hospitals because of varying economic strictures. What then must we do? Where else should we go? How do we get there? I intend to use the next few minutes to share my thoughts on these posers.

If we consider the evolution of the circumstances that have made our foreign counterparts more productive, it becomes evident that we shall need to create the enabling environment to encourage our doctors and other professionals to rise to the challenges of giving their best to our fatherland. We must learn from their experience!! For example, the practice of general paediatrics and paediatric surgery was being undertaken without much enthusiasm in Britain until the introduction of the NHS towards the end of the first half of the 20th century made it profitable and worth the while of the doctors and surgeons. Before the advent of the NHS, patients paid the Doctors and surgeons directly from their pockets. Since children generally had little or no economic resources of their own it was obvious that those who would dedicate their professional lives to the care of children must of necessity be less well off materially than their contemporaries. The introduction of the NHS which transferred the financial responsibility for the health of the citizens to the State changed that and encouraged more surgeons to devote their time to the care of children. I sincerely hope the introduction of the health Insurance scheme launched in June 2005 will have similar effects on the practice of medicine in our country. However, there are danger signs in that someone will still have to be responsible for the health of those who may not be able to pay premiums. There is still a great need for the State to make provision for those segments of our population that are economically and politically disadvantaged. Children, particularly of the poor, must be protected from the almighty Market forces. The state must be responsible for them.

Mr. Vice Chancellor, I shall not end this lecture without addressing the question of brain drain particularly as it affects the Health care industry and the educational system in our country. For many years now we have watched rather helplessly as our professionals have had

to leave Nigeria for other countries to achieve some measure of professional satisfaction and perhaps economic salvation and rehabilitation. While our leaders have never got tired of lamenting the dire consequences of this phenomenon, in my own opinion, they have not really risen to the challenge of correcting the poor funding and decaying infrastructure that have made the practice of medicine in Nigeria unrewarding to both the doctors and the patients. Our leaders sometimes behave as if they believe that all that is good and noble in the medical profession have fled and only the dregs or the foolish are still in the country. Or how do you explain their penchant to jet out of the country at the slightest excuse for medical attention abroad even for conditions that everyone knows are best managed at home at a fraction of what they expend on these foreign medical pilgrimages!!! I would want our leaders to consider the fact that rarely do you see political leaders of even smaller countries in Asia or Latin America put their well being in the hands of foreigners. Perhaps it is part of the vanity inherent in our nation. Yet all they need to do is just rise above their selfish interests and develop the facilities at home. If Nigerian professionals are making exploits abroad we should ask ourselves why we do not have the same at home. It is obvious that the difference must be in the operating environment!! Our leaders should encourage our professionals at home by demonstrating confidence in them. They should help the general population they profess to serve by providing the enabling environment for our Health care professionals to rise to the uppermost limits of their potential. We should believe in ourselves!! I believe therein lies the path to our breakthrough and National redemption.

Mr. Vice Chancellor, distinguished ladies and gentlemen I thank you most sincerely for your attention.

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