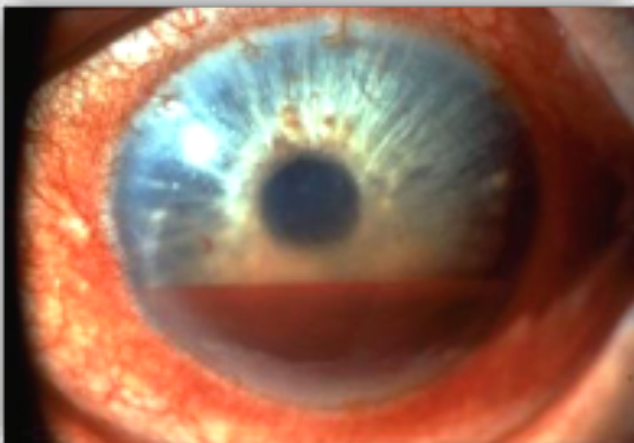
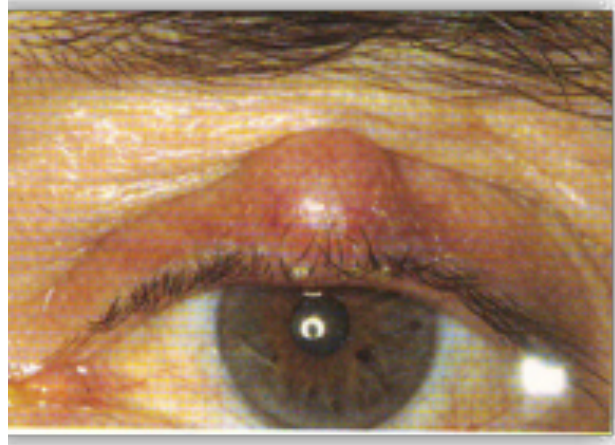


## Tackling the high burden of blindness in South Sudan



- Maxillofacial patient mortality
- Hepatocellular carcinoma
- Prenatal screening for congenital malformations
- Abdominal pregnancy
- Inhaled foreign body

## EDITORIAL

Tackling the high burden of blindness **Wani Mena** ..... 3

## ORIGINAL RESEARCH

Causes of maxillofacial patient mortality in a Nigerian tertiary hospital **Kelvin Uchenna Omeje, Ibiyinka Olushola Amole, Otasowie Daniel Osunde, Akinwale Adeyemi Efunkoya, Akinfenwa Taoheed Atanda** ..... 4

## MAIN ARTICLE

Hepatocellular carcinoma in South Sudan: possible aetiologies, presentation, diagnostic challenges and ways forward **Charles O.C. Langoya and Gasim Omer Elkhailifa Abd-Elfarag** ..... 8

## CASE PRESENTATIONS

Prenatal screening for congenital malformations: diagnosis and management in low and medium income countries **Ipyana H. Mwampagatwa and James Charles** ..... 11

Abdominal pregnancy discovered during laparotomy for complications after attempted abortion **Djongali Tchongchimbo Salathiel, Zapayeke Anicet, Gabkika Bray Madoue, Mahamat Pierre, Hissein Adenao Mahamat** ..... 14

Inhaled foreign body mismanaged as TB, finally removed using a rigid bronchoscopy after 6 years of impaction **Justin Rubena Lumaya and Mubarak Mohammed** ..... 17

## SHORT ITEMS

Guinea worm disease nears eradication 10

News from the Poole Africa Link **Frankie Dormon** ..... 21

RESOURCES ..... 23

BACK COVER Juba Teaching Hospital Electrification Appeal ..... 24

**Cover photo:** Cataract patient, other eye conditions and a tonometer for intraocular pressure measurement

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Dr Edward Eremugo Luka

The *South Sudan Medical Journal* is a quarterly publication intended for Healthcare Professionals, both those working in the South Sudan and those in other parts of the world seeking information on health in South Sudan. The Journal is published in mid-February, May, August and November. *Reviewers are listed on the website*

## Tackling the high burden of blindness

South Sudan is the world's newest country coming into existence on 9th July 2011 after a 20-year protracted civil war that left all infrastructure destroyed and populations displaced. It is also now one of the poorest war ravaged countries in East Africa with the worst development indices.

Although no population studies have been conducted, the prevalence of blindness was estimated in 2007 to be in excess of 1.5% representing about 120,000 people and may even be as much as 3% according to estimates by the Taskforce for prevention of blindness. A further 6% of the population (48,000 people) suffer various grades of visual impairment thus preventing them from engaging in productive activities.

The main causes of blindness include cataract, contributing to between 30-50% of total blindness, refractive errors (15%), trachoma and onchocerciasis 35%.

The aim of the National Eye Care Plan drafted in 2008 is to reduce the prevalence of blindness by 50% from the current level through the development of ophthalmic manpower, provision of infrastructure for eye care delivery and tackling the five preventable or treatable diseases that contribute to 80% of blindness in the country.

Local training started in 2008 with the training of ophthalmic clinical officers (OCO) and ophthalmic nurses (ON), as well as ophthalmic surgical officers (OSO) later in 2010. Overseas training of ophthalmologists is ongoing in East Africa; so far six ophthalmologists are in training in Uganda and Kenya and more places are sought in other African countries. With the establishment of the College of Physicians and Surgeons of South Sudan, we plan to begin local training of ophthalmologists in conjunction with Juba University.

**Causes of blindness include cataract, contributing 30-50%, refractive errors (15%), trachoma and onchocerciasis 35%**

Community-directed treatment of trachoma and onchocerciasis is undertaken through the state ministries of health under supervision from the central ministry of health. SAFE (Surgery, Antibiotics, Facial cleanliness and Environmental improvement) strategy for control of trachoma is aggressively being implemented through support from the Carter Center and other NGOs including CBM, Sight Savers International and Light for the World. However complete mapping of trachoma is not completed due to security and logistic challenges in states currently affected by civil strife.

In conclusion it is noted that South Sudan has a high prevalence of blindness most of which is preventable. Addressing manpower needs through training and retraining of available eye health workers, availing appropriate infrastructure for eye care delivery, and tackling the five major eye conditions that contribute to most blindness could reduce the current burden of blindness. This would open the window for addressing glaucoma, diabetic retinopathy, and macula degeneration which are the new emerging global consequences of non-communicable diseases.

**Dr Wani Mena**

Chief Ophthalmologist and Head of Eye Department

Juba Teaching Hospital, and

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South Sudan Medical Journal

# Causes of maxillofacial patient mortality in a Nigerian tertiary hospital

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**BACKGROUND:** An analysis of maxillofacial mortality was done in a Nigerian tertiary health care centre to determine the major causes of mortality and identify possible predisposing factors in our environment.

**MATERIALS AND METHODS:** A retrospective analysis of mortality in maxillofacial surgery department of Aminu Kano Teaching Hospital from January 2005 to December 2014 was done. Data were analyzed using statistical package for social sciences (SPSS) version 15.0 (SPSS Inc, Chicago, IL).

**RESULTS:** A mortality rate of 1.8% (46 deaths from 2,540 admissions) was recorded. There were 35 males (76.1%) and 11 (23.9%) females. The mean age of the deceased patients was 40.0±13.0 years. Orofacial infections (41.3%) and advanced (stage IV) orofacial malignancies (28.3%) accounted for most deaths.

**CONCLUSION:** Fascial space infections and orofacial malignancies contribute largely to mortality in our setting. Late presentation was a major factor predisposing to mortality.

**Key Words:** *Audit, Maxillofacial Patient, Mortality*

## Introduction

One of the major aims of patient management is the prevention of mortality but it is still encountered in clinical practice [1, 2]. Mortality in maxillofacial patients often result from involvement of other systems as may be seen in Ludwig's angina or severe brain injury following craniofacial trauma and stage IV malignancies [2, 3, 4]. Intraoperative deaths may also occur from anesthetic and/or surgical complications occasionally.

While studies exist on patients' mortality generally [1, 5], reports on oral and maxillofacial patients' mortality especially in Nigeria is sparse [2, 6, 7, 8]. In the present study, we undertook an audit of maxillofacial mortality in a tertiary health care center in northern Nigeria, with the aims of determining major causes of maxillofacial mortalities and identifying possible predisposing factors.

## Patients and methods

A retrospective review of all mortality under the maxillofacial surgery department of Aminu Kano Teaching Hospital (AKTH) over a ten-year period (January 2005 – December 2014) was done. Data were obtained from

case folders, mortality forms and registers (accident and emergency, admission wards and theatre). None of the patients had autopsy records for review. Information collated included patients' age, sex, working diagnosis, duration of admission, treatment carried out, the cause of death and point of demise (ward, accident and emergency or operating room). In the case of malignancies, the biopsy reports were retrieved. Possible predisposing factor for patients' death was also extracted from the case notes, duplicate mortality forms or both.

Patients who were confirmed dead on arrival were excluded from this audit and the underlying cause of death was considered to be the disease or injury that initiated the train of morbid events leading directly to death or violence that produced the fatal injury (adopted from Iliyasu et al [9]).

The data were analyzed using statistical package for social sciences (SPSS) version 15.0 (SPSS Inc, Chicago, IL). Absolute numbers and simple percentages were used to describe categorical variables. Quantitative variables were described using measures of central tendency (mean, median) and measures of dispersion (range, standard deviation) as appropriate.

## Results

A total of 2,540 (1,979 males, 561 females) maxillofacial admissions were made during the period under review; of these 46 mortalities were recorded (1.8%) of which 35 (76.1%) were male. The mean age of the deceased patients was  $40.0 \pm 13.0$  years; the age distribution is presented in Table 1. All the deceased subjects practiced Islam as a religion.

The working diagnosis of all the mortalities along with the possible predisposing factor to mortality are presented in Table 2. When considering where patients died, one patient died in the accident and emergency unit while 42 patients in the maxillofacial ward. There were three intraoperative deaths, two of whom were patients

with temporomandibular joint ankylosis who underwent distraction osteogenesis and interposition arthroplasty respectively. The third case had histologic diagnosis of odontogenic fibroma.

The average admission time was 3 weeks, and this included the time spent at the accident and emergency before transfer to the ward. Details of the treatment carried out and the causes of death are presented in Tables 3 and 4 respectively. The cause of death was documented in only 23 subjects. Intensive care unit (ICU) admission had been recommended for 25 of the diseased patients (54.3%), 24 of whom were unable to access the ICU due to lack of finances and the only one whose relatives were willing to pay could not access it because of lack of available ICU space at that time. The need for or against ICU admission were not captured in the records of other patients.

## Discussion

A literature search found few mortality studies carried out in maxillofacial surgery units, (Fahad et al [2]). Although Verco et al [10] studied only mortality in maxillofacial day surgeries, where stringent measures were used to select only cases whose surgeries did not exceed 30-45 minutes and excluded patients who were significantly medically compromised, they recorded 0.13% mortality in 5 years. In contrast, Fahad [2] working in an independent maxillofacial center, which is not a part of a medical hospital, recorded a mortality rate of 0.0021% in a 3-years retrospective analysis. These values were much less than

**Table 1. Distribution of patient mortality by age.**

Age Range Year	Frequency n	Percentage
0-10	5	10.9
11-20	4	8.7
21-30	5	10.9
31-40	10	21.7
41-50	7	15.2
51-60	11	23.9
61-70	3	6.5
>70	1	2.2
<b>Total</b>	<b>46</b>	<b>100</b>

**Table 2. Patients' diagnoses, frequency distribution and possible predisposing factors for mortality**

Diagnosis	Details	Possible predisposing factor	Frequency (%)
Benign odontogenic tumor	Ameloblastoma (3), Odontogenic fibroma (2)	General anesthesia, advanced age, excessive bleeding, tracheostomy	5 (10.9)
Malignant tumor	Soft tissue sarcomas (4), Salivary gland tumours (3), Squamous cell carcinoma. (3), Merkel cell carcinoma. (2), Burkitt's lymphoma (1)	Stage IV disease with multi-organ involvement/extreme age	13 (28.3)
Gunshot injuries	trauma to neck region (1) and base of tongue (1)	Excessive blood loss, vital organ damage	2 (4.3)
Infection of the maxillofacial region	Ludwig's angina (17), Cavernous sinus thrombosis (2)	Overwhelming sepsis/septic shock	19 (41.3)
Facial fractures	Pan-facial fractures (2), Splenic rupture (1)	CNS involvement, intra-abdominal injury	3 (6.5)
TMJ ankylosis	Distraction osteogenesis (1), interpositional arthroplasty (1)	Tracheostomy related, blind nasal intubation	2 (4.3)
Cancrum oris	Pulmonary tuberculosis (1), Severe malnutrition (1)	Immunosuppression/multi-organ involvement	2 (4.3)
<b>Total</b>			<b>46 (100)</b>

**Table 3. Working diagnosis and treatment carried out on patients that died**

Working Diagnosis	Treatment	Frequency (%)
Facial cellulitis/ Ludwig's angina	Incision and drainage	18 (39.1)
Benign odontogenic tumor	Excisional biopsy	12 (26.1)
Gunshot wounds, soft tissue injuries	Exploration/ debridement/ foreign body extraction	6 (13.0)
Facial fractures	Reduction and immobilization	1 (2.2)
Aggressive jaw tumors	Jaw resection and reconstruction	5 (10.9)
Assymetric face ± TMJ ankylosis	Placement of distractors	1 (2.2)
TMJ ankylosis	Interposition arthroplasty	2 (4.3)
Suspected malignant lesion	Incisional biopsy	1 (2.2)
<b>Total</b>		<b>46 (100)</b>

1.8% mortality within a 10-year period in our study. The longer review period in this study, larger volume of patients attended to and an absence of a dedicated ICU as seen in the study by Fahad et al [2] may have accounted for the wide difference in the recorded mortality figures.

The large gender predisposition favoring the male compared to female patients in our study is comparable to the findings in other Nigerian hospitals [11]. The male predominance in the present study, may be a reflection of the pattern of hospital attendance as demonstrated by the high gender ratio (1,979 males versus 561 females) seen during the period of review. The low mean age of deceased patients (40 years) in our study could also be a reflection of the demographic feature of our catchment population and the low average life expectancy among Nigerians.

Infection of the maxillofacial region accounted for the most common diagnosis made amongst the recorded deaths in the present study and Ludwig's angina was the most common of these infections. Ludwig's angina is frequently complicated by spread to secondary spaces in the neck and mediastinum leading to other life threatening complications. All the Ludwig's angina cases recorded in our review were noted to have presented at the extreme of its clinical feature, which is known to confer a poor prognosis. Although Ludwig's angina is associated with

**Table 4. Causes of death in 23 patients**

Cause of death	Frequency	Percentage
Cardiac arrest	9	39.1
Carotid artery blow out	4	17.4
Aspiration pneumonia/ laryngospasm	3	13.0
Anaemic heart failure	2	8.7
Overwhelming infection/ septic shock	5	21.7
<b>Total</b>	<b>23</b>	<b>100</b>

a high mortality even in the developed world, absence of investigations such as blood gas analysis which helps to determine the level of patients toxemia even before clinical features of irreversible organ damage ensues, may have accounted for the high number of Ludwig's angina related deaths in this study. Most of our subjects presented late.

It has been observed that the poverty state of most patients, late presentation at the point of care, ignorance and the medical interference by untrained persons, often lead to most avoidable deaths in accident and emergency units [12]. These factors may have contributed to the mortalities recorded in the present study, considering the level of poverty and ignorance prevalent in most parts of Northern Nigeria, where the study was carried out. Other factors contributing to the poor prognosis may include substandard medications in our markets and inability of the patients to afford essential treatment including intensive care admission.

Intraoperative causes of death have been reviewed in the literature; the most common cause of death is related to anesthesia [5]. Although the maxillofacial surgeon often shares the same operative site with the anesthetist, various methods have been devised to ensure that the relationship is beneficial to both. The use of north and south facing endotracheal tubes, re-enforced endotracheal tubes, cuffed tube systems [13], and placement of packs around the airway are some of the measures that improve the safety of maxillofacial surgery. In one instance, intraoperative death was thought to be due to sudden extensive blood loss from "piece-meal" extirpation of an odontogenic fibroma and an inability to effectively support body compensatory hemodynamic mechanism. In the present study, the intraoperative deaths observed in patients with temporomandibular joint ankylosis were thought to be related to complicated tracheostomy.



Figure 1. 55-year old woman who died from histologically diagnosed squamous cell carcinoma of the oral cavity. (Credit: Department of oral and maxillofacial surgery, Aminu Kano Teaching Hospital, Kano, Nigeria)

Unfortunately, autopsies are not commonly done in this environment due to prevailing socio-cultural and religious beliefs as it is an Islamic requirement that deceased bodies are buried immediately [14]. Seilhean [15] also noted that some religions, including Islam, have an unfavorable disposition to autopsy. Review of patients lost following trauma in our study has emphasized the importance of a prompt and effective triage system. Maxillofacial surgeons should thoroughly review patients and develop a high index of suspicion to observe and promptly refer patients with more emergent medical conditions.

Patients lost from advanced malignancy in our study were from stage IV tumors with significant systemic metastasis (Figure 1). Most of these patients were found to have presented in various centers where they were labeled inoperable and therefore discharged home only to return back to the hospital following the development of complications, which prompted referral. Many patients with advanced malignancy died in the hospital because of the absence of hospice care. When their condition deteriorates, they seek hospital care and may occasionally die in our care. Institution of dedicated hospice centres would help to give these patients a more comfortable end of life care and also enable treatment centres to focus care on subjects with better prognosis.

## Conclusion

Severe orofacial infections (such as Ludwig's angina) and advanced orofacial malignancies are the commonest causes of maxillofacial mortality in our environment. Late presentation of patients with these conditions places them at risk of mortality. There is a need to educate patients, especially at the grass root level on the importance of regular dental visits. In addition, caregivers, particularly at the primary level, should be educated on early recognition of orofacial conditions and the need for prompt referral for specialist attention.

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# Hepatocellular carcinoma in South Sudan: possible aetiologies, presentation, diagnostic challenges and ways forward

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Hepatocellular carcinoma is one of the common malignancies in both the developed and developing worlds. This is most likely due to its wide variety of causes. The aetiologies vary from one part of the world to another determined by many factors ranging from geography, life style, availability of advanced medical care etc among many others. Though the presentation and diagnosis of hepatocellular carcinoma is straight forward in many developed countries, the reality is different in many resource-constrained regions and countries such as South Sudan which has only one Computer-Tomography machine country wide, lack of most of the non-invasive liver screening tests as well as coupled with lack of medical personnel. However, in spite of these challenges, the authors of this article believe that the diagnosis of hepatocellular carcinoma can be reasonably made considering the clinical presentation of this condition and maximizing the use of available diagnostic tools.

**KEY WORDS:** *common malignancies, hepatocellular carcinoma, South Sudan*

## Introduction

Hepatocellular carcinoma (HCC) is the 5th commonest cancer among adult men and the 7th among women. It is the second most common cause of cancer related deaths in the world [1]. In terms of aetiology, it had been shown that almost 80% of global HCC is related to chronic hepatitis B and C infections [2]. This gets us to question the prevalence and distribution of these two viruses. It is argued that the prevalence of HCC is determined by the geographical distribution of these two viruses and the age of acquisition. For example, in the West, the commonest causes of HCC are alcohol related cirrhosis and hepatitis C (due to intravenous drug injection) which are all related to older age while in the developing world, the commonest cause is Hepatitis B virus which is mainly acquired vertically (thus the importance of age of acquisition) and aflatoxin which are related to early exposure. This is further aggravated by the lack of wide Hep B vaccine coverage in the developing world (Sub Saharan Africa) in the past. However, horizontal transmission of Hepatitis B is also on the rise in the developing world among children due to salivary viral shedding while playing with each other. Also, improper/incomplete sterilization of barbers' shavers is another reason for the horizontal transmission among adults in the developing world. Although this partially explains the high Hep B related HCC in the developing world, alcohol is also seen to be rising as a potential cause of cirrhosis and thus, HCC in this part of the world [5].

In South Sudan, there are no data showing prevalence of HCC or its related risk factors such as hepatitis, alcohol consumption and many others.

## Causes of HCC

It is worth noting that 80-90% of HCC present in the background of cirrhosis [3]. So, what are the causes of cirrhosis and which ones are common in South Sudan? It is literally proven that any condition that can lead to cirrhosis of the liver can cause HCC. These conditions include (but not limited to):

- Chronic Hepatitis B and C viruses
- Aflatoxins
- Excessive alcohol consumption
- Moderate alcohol consumption in a background of another liver condition
- NAFLD
- Hemochromatosis
- Wilson's disease
- Right sided heart failure
- Alpha 1 antitrypsin deficiency
- Primary biliary cirrhosis
- Primary sclerosing cholangitis
- Tyrosinosis

Sube et al. determined the co-infection rate between HIV and Hepatitis B and C among blood donors in Juba Teaching Hospital to be 50% and 18% respectively [4].

Although they pinned this down to the common modes of transmission of these viruses, it is worth mentioning that these are high prevalence among healthy population attending for blood donation. Out of clinical experience in South Sudan, one can tell that the prevalence of Hepatitis B and C viruses is high with the former much common than the later. This is a grey area calling for a country-wide research. This high prevalence could be explained by the lack of vaccination (for Hep B) in the past for children due to the civil war which rendered many parts of the country inaccessible. Not only is that, the avoidance of vaccination in the past by communities due to surrounding myths as well can explain this. Therefore, there is a clear need for urgent studies to determine the prevalence of the possible causes of liver cirrhosis and thus, HCC in South Sudan.

### Clinical presentation

Depending on the cause of HCC, patients can present slightly differently. However, keeping in mind that 80-90% of HCC occur in cirrhotic patients, then presentation mimics that of cirrhosis and could be in form of cachexia, jaundice, rapid ascites (due to portal vein thrombosis given that HCC like any other cancer is a pro thrombotic condition), pruritus (due to ductal compression), finger clubbing, right upper quadrant pain, variceal bleeding (hematemesis and/or melaena) etc. On the other hand, HCC can be an incidental finding on an US scan of an abdomen done for unrelated complains. This is rare though.

### Investigating HCC

For every jaundice or liver mass (on examination) of unknown cause, it is always worth performing the routine investigations plus the Non Invasive Liver Screening. The routine tests include: FBCs, Urea and Electrolytes, LFTs and coagulation. These could offer a hint on the possible aetiology or performance status. For example, raised MCV (alcohol?), very high WCC (Leukaemia? Infection?), thrombocytopenia (alcohol? portal hypertension?), raised urea and creatinine (hepatorenal syndrome?), very high GGT (HCC?, Alcohol?), deranged coagulation (failing liver? DIC?), very high AST and ALT (Ischaemic liver? Paracetamol overdose?), low platelets and high INR (reconsider liver biopsy?)

Non-Invasive Liver Screening Tests (NILS) include:

- Liver auto antibodies: AMA, Gastric parietal cell, LKM antibody and Smooth muscle antibody.
- Immunoglobulin G, A and M: Looking for autoimmune hepatitis
- 24 hr urinary copper and serum ceruloplasmin: In those under 40 yrs looking for Wilson's disease
- Alpha 1 antitrypsin level: Looking for a low level
- Alpha fetoprotein: When there is a mass on imaging

- Hepatitis B and C. Can cause both acute and chronic liver disease though acute presentation is rare in C.
- Hepatitis A, CMV, EBV and Adenovirus: For acute jaundice only. They don't cause chronic liver problems. In South Sudan, most people are immune to these.
- Serum ferritin level: If high (supported with clinical features), think of HFE gene
- Serum lipids: If you are thinking of NAFLD
- US abdomen: Liver, spleen, gall bladder, CBD, ascites, PV, HV, head of pancreas, etc. On finding a low attenuating hepatic lesion on US, there should be a high index of suspicion for a HCC and thus, an alpha fetoprotein and CT chest, abdomen (liver) and pelvis should be requested to clearly define the liver lesion(s) and establish any metastases. However, a definite diagnosis of an HCC is histological. Tissue is usually obtained by an US guided liver biopsy which is safer than a blind intervention. [6]

### Diagnostic challenges in South Sudan

South Sudan has very limited tests to investigate HCC and its possible cause(s) beside hepatitis serology, ultrasound and a CT (only found in one private facility). There is an absence of all the other relevant tests and only two pathologists in the country (when thinking of biopsy). Some private facilities can perform the AFP titres as well. This is the reality at the time of writing and publishing this article. These limited resources make it hard (but not impossible) to reasonably diagnose HCC and determine a possible cause. A strong clinical sense (supported by detailed history and examination) with a maximum use of the available limited resources should allow this to happen though undoubtedly, we shall be missing out some aetiologies for HCC. So, the authors of this article are saying, US, AFP, LFTs, viral hepatitis serology and a good clinical approach should pick up most of the HCC cases and determine their viral causes.

### Treatment modalities

Definitive curative treatments for HCC are either hepatic resection or liver transplantation. This entirely depends on the size, number and spread (metastasis) of the cancer. This is outside the scope of this article. However, it is worth mentioning that all patients with a HCC (non metastatic) be referred to specialist care (non-existent in South Sudan) immediately as some of them could benefit from interventions such as Radiofrequency ablation (RFA), Trans-arterial Chemoembolization (TACE), resection or transplant.

For those with clear metastatic disease, it is worth

offering specialist option as well for palliative purposes. All these treatment options are currently missing in South Sudan and therefore, it is worth to critically think and maximally involve patients in deciding the balance between the costs of foreign travelling and medical care/ outcome expected to that of remaining at home and spending quality time with family.

### Conclusions and ways forward

From the review of articles and the possible causes and prevalence of HCC, it is clear that South Sudan is a country in a belt with a high risk of HCC. It is therefore worth investigating patients with suspicious liver lesions on imaging or liver enzymes. It is also worth maximizing our clinical senses in obtaining detailed risk history (to complement our limited investigations) as well as maximally using the available resources. Research is definitely needed in this field to determine common causes of HCC in South Sudan and their distribution nation-wide.

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## Guinea worm disease nears eradication

Guinea worm disease, or dracunculiasis, is a parasitic disease caused by the nematode worm *Dracunculus medinensis*. People become infected when they drink water contaminated with copepods (water fleas), which are the vector of the disease. When the copepods are dissolved by gastric juice, larvae of dracunculus are released, and penetrate the stomach or intestine. Mating between male and female worms occurs in connective tissue about 3 months after infection, after which male worms die. Female worms migrate, usually to lower limbs, about 8–10 months after infection. Emergence of the worm through the skin to shed larvae causes an intense burning and itching sensation. Patients may try to relieve symptoms by immersing the lesion in water sources that are also used for drinking, which in turn allows larvae to infect copepods and continue the life-cycle. The disease is seldom fatal, but the only form of patient management is the slow extraction of the emerging female worm by winding it around a stick, which can take weeks during which time the patient may be too incapacitated to carry on activities of daily living.

Africa was once plagued with guinea worm disease, but it began to disappear as water treatment improved. Even in 1986 there were an estimated 3•5 million cases annually. However, the past 30 years have seen a decline in cases to just 22 in 2015. Only four countries are now affected: Chad, Ethiopia, Mali, and South Sudan (5 cases). There is no drug treatment or vaccination – only simple effective preventive measures which include stopping people from drinking water contaminated with copepods by providing safe water sources, filtering water through a fine mesh, boiling, or treating water sources with a larvicide to kill copepods. People with emerging guinea worms are prevented from entering water sources by community level case detection and guarding water supplies.

The Carter Center has coordinated funding, persuaded companies to donate larvicides and materials for water filters, liaised with governments, and even organised a 6 month “guinea worm cease fire” during Sudan’s civil war.

See [http://www.cartercenter.org/health/guinea\\_worm/index.html](http://www.cartercenter.org/health/guinea_worm/index.html) and The Lancet Infectious Diseases [http://dx.doi.org/10.1016/S1473-3099\(16\)00020-7](http://dx.doi.org/10.1016/S1473-3099(16)00020-7)

# Prenatal screening for congenital malformations: diagnosis and management in low and medium income countries

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Prenatal screening for foetal malformation is an important component of prenatal care. Unfortunately it has not been adequately addressed in many low and medium income countries (LMIC). The literature indicates that this condition is one of the most important causes of newborn deaths.

There are many screening methods but most are expensive and some require intensive training. A relatively cheap, safe and easy-to-perform method of ultrasound can help identify more than 50% of foetal malformations. Unfortunately this technique is not readily available and even when a diagnosis is made the option of pregnancy termination involves cultural and ethical issues.

This case series attempts to address the challenges faced by LMIC care providers and clients.

**KEY WORDS:** *foetal malformation, newborn deaths, prenatal care, pregnancy termination*

## Introduction

Major congenital malformations incompatible with life occur in 2-3% of all fetuses [1]. They are the cause of 20 – 30% of perinatal deaths [2]. Apart from occasional case reports little has been published on this topic in Tanzania.

Detection and management of these malformations rely on antenatal screening. The advantages of such screening include helping the clinician and parents to manage the pregnancy including whether to continue until term, determine the likely outcome, plan for complications during labour, and after birth, and identify risk factors for future pregnancies [3]. Simply put, prenatal screening and diagnosis serves to increase the possibility of optimal care of the pregnancy in terms of antenatal care, and referral for birth as required [1].

Many screening and diagnostic procedures exist (both non-invasive and invasive). Ultrasound scanning is non-invasive but sometimes a combination of techniques are needed to increase the accuracy of diagnosis [4]. This article shows the dilemma that clinicians face in making decisions in resource constrained settings.

## Material and methods

Randomly selected congenitally malformed babies born at Makole Municipal Hospital (2011 - 2014) were photographed and only represent a proportion of all the malformed babies born here.

The Facility is a District Hospital run by the Dodoma Municipal Council with a catchment population of approximately 450,000 [5]. The facility provides antenatal services and delivers about 30 babies daily.

## Case reports

The following cases were attending antenatal clinics in different facilities and referred for delivery at this hospital because of suspected abnormalities.

**Case 1.** This baby was born vaginally at 36 weeks to a primigravida woman aged 23 years – see Figure 1. The only reported finding antenatally was an abnormal lie. Ultrasound had not been available. The baby had an Apgar score 5 at birth and 1 at five minutes and died on the same day.



Figure 1. Case 1 (credit Municipal Medical officer, Dodoma)

**Case 2.** This anencephalic baby was stillborn vaginally at 37 weeks gestation to a primigravida aged 27 years – see Figure 2. The diagnosis of anencephaly was made by ultrasound at 23 weeks but the pregnancy continued to term. There was no history of drugs use or alcohol consumption



Figure 2. Case 2 (credit Municipal Medical officer, Dodoma)

**Case 3.** This stillborn baby had anencephaly and abdominal wall defects and delivered at 30 weeks to a 26 year old gravida 3 – see Figure 3. Apart from a low fundal height compared to dates, no abnormality was noted. Ultrasound had not been available.



Figure 3. Case 3 (credit Municipal Medical officer, Dodoma)

**Case 4.** This baby with anencephaly and abdominal wall defects was delivered alive by a 30 years old gravida 2 but died hours later – see Figure 4. A twin pregnancy had been suspected but ultrasound had not been available.



Figure 4. Case 4 (credit Municipal Medical officer, Dodoma)

## Discussion

Studies have shown that 70-92% of the central nervous and cardiovascular abnormalities occur in women with low risk [6]. This indicates the importance of screening of all pregnancies even if they fall in the low risk category.

The lack of appropriate affordable diagnostic equipment and expertise contributes to low detection rates in low and medium income countries (LMIC). Techniques for screening fall into two groups:

- Non-invasive: biochemical markers, isolation of foetal cells in maternal circulation, and ultrasound.
- Invasive: amniocentesis, chorionic villi sampling, foetal blood and tissue sampling.

Ultrasound is a simple and affordable method [7] but was not available in three of the cases described here. If ultrasound and trained personnel had been available, the malformations could have been detected earlier with subsequent more appropriate management – including counseling of the parents to reduce the grief and self-blame.

The accuracy of ultrasound varies from 22% to 74% [7]. This depends on the ultrasonographic skill, gestation age and type of malformation. However it remains the most affordable and low risk technique. There is a need for policy makers to introduce guidelines for screening using this approach.

Management is an enormous challenge and falls into three categories:

- Continue with the pregnancy.
- Foetal treatment where feasible.
- Termination of pregnancy.

For most LMIC, foetal termination of malformed fetuses is not an option. In Tanzania, for example, the only legal indication for termination is when the life of the mother is endangered. Therefore, whatever the prenatal findings, continuing with the pregnancy is the only option [8].

In the USA, most (95%) detected severely malformed foetuses are electively aborted [9]. These observations suggest that a review of the law in Tanzania should be considered to allow severely malformed babies incompatible with life to be electively aborted.

Ethical issues also arise when it is known that a malformation is incompatible with life. Faced with such a dilemma parents are intensely stressed [10]. In Case 2, the couple opted to continue to term but were severely disappointed at birth. Ethical principles also put clinicians in a dilemma and pose a challenge in deciding whether or not to terminate the pregnancy. Some clinicians take the

view that termination is morally unjustified while others advocate termination when the foetus is felt unlikely to survive [11].

Another challenge that face LMIC is the accuracy of the ultrasound diagnosis. In the developed world other multiple methods, including ultrasound, are combined to make a clearer diagnosis [12].

In many LMIC documentation of the incidence of congenital malformations, miscarriages and deaths is inadequate and therefore the available data may not be reliable and the magnitude of the problem cannot be adequately addressed. In developed countries like the United Kingdom congenital malformation are recorded hence their data are highly reliable [13].

The literature indicates that about 20% of the malformations are severe and life threatening [14]. Care of the surviving babies is always costly and frequently lifelong [15] which LMIC cannot afford; these babies eventually die distressing both parents and practitioners.

## Conclusion

Prenatal diagnosis and management of foetal malformations in developing countries remain a challenge. There is a need for rational guidelines adapted to local circumstances, adequate diagnostic equipment and trained personnel. Viewed from the practitioner's perspective, the abortion law in Tanzania may need review.

## Ethical issues:

Mothers gave informed consent to take photographs of their babies and authorization for publication was obtained from the Facility Management. Ethical clearance was obtained from the University of Dodoma Ethical Committee.

**Conflicts of interest:** None

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# Abdominal pregnancy discovered during laparotomy for complications after attempted abortion

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We report a case of abdominal pregnancy with a dead fetus of 19 gestational weeks and 3 days discovered incidentally during a laparotomy following complications of attempted abortion. Abdominal pregnancy is a rare form of ectopic pregnancy (1% of all ectopic pregnancies) usually diagnosed by ultrasound. In this case, a hysterectomy was performed after discovery of uterine perforation, followed by a complete, easy, and non-hemorrhagic detachment. The fetus and membrane were discovered during abdominal toilet. The postoperative course was marked by the formation of a small hematoma at the site of the fetus and membrane implantation which required removal. The patient was released on the 11th postoperative day.

**KEY WORDS:** *abdominal pregnancy, ectopic pregnancy, abortion*

## Introduction

Chad is a sub-Saharan country where reproductive health problems are still acute [1]. There is a high maternal mortality ratio, a low contraceptive prevalence, a high prevalence of induced abortions among teenage girls (18.4 % of all teenage pregnancies) due to the restrictive abortion law, poor perinatal care, difficult access to ultrasound services, and poverty. Most pregnancies in developing countries go forward naturally without any ultrasound scans or with erroneous ones. Abdominal pregnancy may mimic other intra-abdominal pathology and without ultrasonography makes diagnosis of this rare condition difficult [2].

## Case Report

Mrs M.Y. was 30 years old and in her 8th pregnancy. She had had one previous Caesarean section in 2005 and had five living children. Oral contraceptives had been used from 2012 to 2014. She was admitted as an emergency to N'Djamena Mother and Child Hospital on May 12th 2015 with abdominal pain and bleeding after an attempted abortion in an N'djamena's peripheral health center – which the patient had requested because the pregnancy was unwanted. No scan had been performed and several abortion attempts had been made by unskilled individuals using sharp objects and in deplorable hygienic conditions. As the patient still felt pregnant, she attended a district hospital where manual vacuum aspiration (MVA) and curettage were carried out without success.

Physical examination: The woman was in a good general condition, conscious with pale conjunctivae

suggesting anaemia - which was confirmed with a blood test showing haemoglobin to be 6.4g /dl.

Obstetrical examination: The abdomen was enlarged and supple. The uterus did not reflect the gestational age, and was painful and soft, thus difficult to assess. The cervix was posterior, shortened and closed. Dark red blood appeared on the examining glove. An ultrasound scan showed a gestational sac with a fetus of about 19 weeks and 3 days without cardiac activity in contrast to the physical examination. However, the clinical staff of the MCH decided to expel the fetus by using misoprostol followed by uterine aspiration. Antibiotic cover was given (using amoxicillin and gentamycin) and a transfusion of two units of total blood. During this maneuver, the uterus was discovered to be empty. Thus a laparotomy through an old Pfannenstiel scar was performed under general anesthesia. The findings were:

- A small peritoneal haematoma consisting of a few blood clots (150g) and a little fluid blood (about 250 ml in the pouch of Douglas);
- Uterine perforations: in the fundus and the left horn, caused by abrasive abortive maneuvers. Uterus scar was intact;
- An abdominal (supra pubic) haematoma separated from the bladder which was intact. The fallopian tubes and ovaries were intact without lesions.

A hysterectomy was performed without finding the gestational sac seen in the scan. After cleaning the abdominal cavity using physiologic serum, a soft and

smooth mass with regular contours was found in the epigastric region. Hence the laparotomy was enlarged in a T-shape. A complete gestational sac, with a dead foetus bathing in amniotic fluid and the placenta attached to the upper part of the transverse colon, was found. It was in a capsule made by omentum (see Figure 1).



Figure 1. Image of a complete gestational sac found in the transverse colon. (Credit Djongali Tchongchimbo Salathiel)

After the separation of adhesions the detachment was easy with little bleeding and satisfactory hemostasis on insertion points. During the postoperative course, a small hematoma at the gestational implantation site was noticed and removed. The outcome was good and the patient was discharged on the 11th postoperative day. No histopathological examination was carried out due to financial reasons.

## Discussion

Our patient was 30 years old. In Gabon, Picaud and al [3] reported 11 cases of abdominal pregnancies with a median age of 27 years (range 22 – 44 years). In the Democratic Republic of Congo, Kangulu and al [4] published a case of an abdominal pregnancy in a 22 year-old patient. These publications show that abdominal pregnancies can occur in any age during the reproductive period, and in primigravidae, paucigravidae or multigravidae. Predisposing factors described by earlier authors [5, 6, 7, 8] were also found in our case: a history of Caesarian section, induced abortion, use of contraceptives method (coil or intrauterine contraceptive device) genital infection and a lower socioeconomic situation. Correa [9, 10] noted that abdominal pregnancy was associated with poverty.

Abdominal pregnancy frequency is high in developing countries due to the high incidence of genital infections, ignorance and inadequate pregnancy surveillance [8, 10]. Genital infections like salpingitis predisposes to ectopic pregnancy by impairing the passage of the ovum along the fallopian tubes to uterus.

Clinical diagnosis of abdominal pregnancy is difficult without ultrasonography [7]. In our case, the discovery

was lucky because the emergency laparotomy revealed the situation. The ultrasound scan had shown an intra-uterine pregnancy. A vaginal scan should ideally be done before any conclusion about the location of the gestational sac is made. As in previous studies [4, 8, 10] we recognize that this pathology is still difficult to diagnose (in the first or second trimester of pregnancy). In other areas, X-rays are used to diagnose foetal death.

Like earlier authors [4, 8, 10], we performed a laparotomy; the findings suggest that this case is a secondary abdominal pregnancy because:

- Using diagnostic criteria for primitive forms of abdominal pregnancy described in 1942 by Studdiford [10]: the tubes were healthy and the uterus unruptured except for minor perforations and a supra pubic hematoma - which was partially separated from the bladder; therefore, this abdominal pregnancy would be secondary to an earlier uterine perforation, especially since there were several abortion attempts.
- The hypothesis of a complete abortion through a uterine breach is difficult to deduct. This account of a foetus in an intact bag of membranes going through a uterine breach is astonishing because it is far more likely that the bag would have been broken by the violent manoeuvres of the abortion attempts. If there had been funding for sending the pregnancy to histology this would have been useful as it could have told us more about the implantation history.

In our case, postoperative morbidity was marked by the resumption of bleeding at the gestational sac implantation site. This complication has also been reported by other authors [4, 7, 9].

## Conclusion

Peritoneal or abdominal pregnancy may be asymptomatic initially. It is a surgical emergency because the pregnancy can damage any organ to which it is attached. In this case it could have caused serious problems with the woman's bowel. It is frequent in poor countries where the risk factors listed above are found. In order to reduce maternal mortality, it is necessary to:

- Prevent unwanted pregnancies,
- Have an early diagnosis, and monitor pregnancies by improving ultrasound accessibility which is essential in the diagnosis of ectopic pregnancies in general and abdominal pregnancies in particular.

For countries like Chad, and South Sudan, training for medical and paramedical staff in the practice and systematization of obstetric ultrasound during pregnancy is necessary to improve diagnosis and prognosis.

## Authors Approval

All authors approved the submission of this article.

## Conflict of interest

There are no conflicts of interest.

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## Consent

For this work we received the patient's consent and the consent of the director of N'Djamena Mother and Child hospital (Chad).

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## Congratulations to Dr. Victor Vuni

Dr Victor Vuni Joseph has passed his degree of Doctor of Philosophy in Medicine at the University of Leeds, School of Medicine, United Kingdom.

The subject of his Doctorate Research is 'Why and how new technologies fail or succeed to embed in routine health services' drawing on lessons from the implementation of telehealth (telemedicine). The purpose of the study is to help worthwhile new technologies to embed in routine health service delivery in order to improve access to healthcare, reduce hospital admissions, save costs of delivering healthcare, improve quality of life, and save lives. The thesis can be accessed at [www.ethesis.whiterose.ac.uk](http://www.ethesis.whiterose.ac.uk).

Dr Joseph, a Fellow of the Faculty of Public Health of the Royal College of Physicians of the United Kingdom, has been a Consultant in Public Health in Doncaster, England for over 10 years. He is an Educational Supervisor for the specialist public health training programme of the UK Faculty of Public Health (FPH), and co-chair of Public Health Africa, a special interest group of the FPH.

He remained engaged in supporting the Ministry of Health in Juba, South Sudan since the formation of Government of South Sudan (GOSS) following the Comprehensive Peace Agreement of 2005.

# Inhaled foreign body mismanaged as TB, finally removed using a rigid bronchoscopy after 6 years of impaction

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Foreign body aspiration is an important cause of mortality in children aged less than three years. Foreign body (FB) inhalation can pose diagnostic and therapeutic challenges, especially in longstanding cases and complications such as recurrent pneumonia, lung collapse and lung abscess may develop. We report a case of an 11-year old boy with foreign body impacted in his bronchus for six years, which was mistakenly managed as pulmonary tuberculosis. Radiological evidence confirmed the diagnosis and a rigid bronchoscopy was used to remove the metallic foreign body.

The standard of care for the management of a FB in a bronchus is a rigid bronchoscopy; however flexible bronchoscopy can be used, especially in adults. A thorough history with radiological evidence are essential and sometimes, followed by a diagnostic bronchoscopy.

**KEY WORDS:** *bronchus, foreign body aspiration, metallic foreign body, radiological evidence, rigid bronchoscopy.*

## Introduction

Foreign body aspiration (FBA) is one of the leading causes of sudden death among children aged less than three years [1]. Aspiration is common in this age group because of the less effective and protective mechanisms involved in coordination of breathing and swallowing [2]. FBA resembles a number of pulmonary diseases and so poses a great challenge to clinicians for its management [3]. The diagnosis depends on a history of sudden cough, difficulty in breathing, and/or stridor in an otherwise healthy child. Rigid bronchoscopy is the standard of care for both diagnostic and therapeutic purposes [4].

## Case Report

### History and examination

An 11-year old boy was referred from a nearby district to Mulago National Referral Hospital on the 9th October 2015 with a history of recurrent chest infections. It was reported that 6 six years ago there was a sudden onset of cough, intermittent fever, noisy breathing (wheezing), difficulty in breathing, and chest pain. However there were no night sweats, weight loss or contact with a tuberculosis patient. The boy was admitted to a district hospital several times over this period for different diagnoses such as severe pneumonia, asthma for which he had received antibiotics, steroids, bronchodilators and expectorants. The last admission before referral was in August 2014 when he was investigated for tuberculosis, Acid Alcohol Fast Bacillus (which was negative), chest X-ray, and HIV (negative).

Examination: Young boy; well nourished; not wasted, pale, jaundiced or distressed. He had digital clubbing with a single, non-tender, 3 x 2cm mobile soft left cervical lymph node enlargement level III (middle jugulo-diagastic); no lower limb oedema. Weight = 32kg; temperature = 36.8C; respiratory rate =20; SPO2 = 94%.

### Chest findings

Asymmetrical chest movements without obvious deformity, trachea slightly deviated to the left with a dull percussion note and reduced breath sounds.

### Cardiovascular System

BP=100/60; PR=80; Apex beat 4th ICS, slightly displaced laterally from mid-clavicular line, Heart sounds normal.

### Previous treatment

In August 2014 he had been started on anti-tuberculosis treatment and a slight clinical improvement over a month was reported despite no radiological changes. Anti-tuberculosis treatment had been continued for 8 months (until April 2015) after which he had been referred to Mulago National Hospital as a case of multi-drug-resistant tuberculosis.

### Investigations at Mulago TB Department

These revealed a foreign body (FB) impacted in the distal left main bronchus. Figure 1 shows and describes the pre-admission X-ray findings, and Figure 2 the CT scans.



Figure 1. Pre-admission X-ray shows homogenous opacity in the left lung especially the lower lobe (Silhouette sign), foreign body (arrowed) appeared radio-opaque in the distal end of left main bronchus. There is a left mediastinal shift and compensatory hyperinflation of the right lung. Evidence of left lower lung atelectasis and upper left lobe multiple consolidations.

The cardiothoracic (CT) surgeons and Ear, Nose and Throat (ENT) surgeons were consulted for further management.

## Management

The cardio-thoracic surgeons reviewed and put the patient on antibiotics (cefixime 200mg daily) expectorants (Brozedex Syrup [bromhexine hydrochloride, terbutaline sulphate, menthol]) and steroids (dexamthasone in 8mg – 2 divided doses). Initially the plan was to do a left sided lobectomy based on the findings on the images and the long history.

The ENT surgeons' opinion was to do a rigid bronchoscopy, which was done on the 22nd October 2015. The first attempt was unsuccessful due to bleeding following removal of granulation tissue and mucus accumulation which covered the FB in the distal end of the left main bronchus – see Figure 3.

The patient was put on steroids and antibiotics for another four days giving a total of 2 weeks. A second

attempt was carried out successfully on the 26th October 2015 and the metallic end of a pencil and its rubber were discovered– see Figures 4 and 5. The patient was discharged in the fourth postoperative day. There was marked clinical and radiological improvement.

## Discussion

FBA is common among children and 73-80% of cases are diagnosed from history alone. The lapse between aspiration and diagnosis can vary from days to several months and even years [1]. This is seen in our case where the metallic FB was impacted for almost six years.

In the United States, until 1986, 7% of sudden deaths in children aged under four years old were directly linked to FBA. Approximately 75% to 85% of all FBAs occur in children younger than 15 years old; however, it is most common in children aged less than three years [5].

Children are more prone to FBA due to their tendency to place objects in their mouths, to have less developed protective reflex coordination between swallowing and inhalation, and also because they have a high incidence of upper respiratory tract infections (which makes them mouth breathers, and therefore take deep inhalations during coughing [2]).

Males are affected more frequently than females due to their greater physical activity [6]. Studies have shown that the most common types of FBA inhaled are organic materials like nuts, vegetables and seeds, while inorganic materials (e.g. metallic) constitute 4.4% of objects [7]. The foreign body in our case was an inorganic material (metallic top of a pencil and its rubber).

FB inhalation can pose diagnostic and therapeutic challenges and can be life-threatening if not properly managed [8]. Unsuspected longstanding cases may lead to complications such as recurrent pneumonia, bronchiectasis, atelectasis, and lung abscess [2]. FBA can mimic other pulmonary diseases with similar presentation and this may lead to misdiagnosis in about one fifth of cases [3], as occurred in this case where the patient had been managed as for pulmonary tuberculosis.

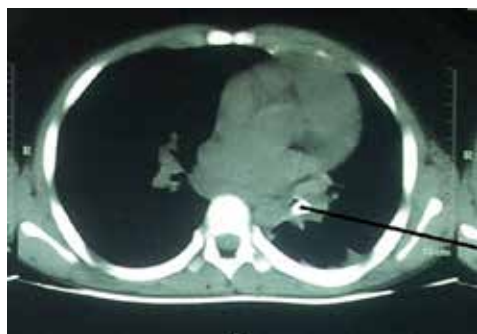


Figure 2a, b, c. CT-Scan findings before intervention (bronchoscopy). Showing evidence of hyper-inflated right lung, left lower lobe atelectasis, mediastinal shift and a clear radio-opaque foreign body in the left main (arrowed) bronchus.

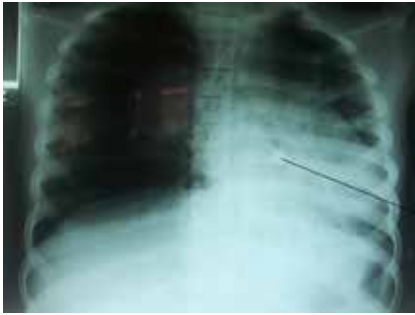


Figure 3. Post-operation X-ray after the first bronchoscopy. The foreign body (arrowed) is more visible in the distal end of the left main bronchus; despite the failed attempt there is evidence of better left upper lobe aeration compared to the pre-admission image.



Figure 4. Post-operation X-ray after second bronchoscopy. The removal of the foreign body resulted in better left lung tissue aeration and reduced right lung hyperinflation.



Figure 5. Metallic top of a pencil and the rubber removed from the distal end of the left main bronchus.

### Pathophysiology

FB can lodge with equal frequencies in the right or left main bronchus because the angle of bifurcation of the trachea is the same in children (<15 years) [9]. As a result of FB impaction local inflammation, oedema, with cellular infiltration and granulation may form, which further compromise the airway. These pathological changes make it difficult to extract the FB due to bleeding and poor field visibility, which lessens the chance of successful removal at first attempt [10]. In our case, removal of the FB was successful in the second attempt. It was noticed radiologically that aeration had greatly improved at the lung apex compared to the first chest X-ray after the first bronchoscopy despite failure to remove the FB. This can be attributed to the fact that some granulation tissues had been removed and suction of all the mucus accumulation partially opened the bronchial tree.

Clinicians should be alert to the possibility of a FB especially in those cases with a vague history but yet positive clinical signs [4].

The systematic algorithm for diagnosis should start from a witness report, history of sudden cough, difficulty in breathing, stridor, wheezing and cyanosis in an otherwise healthy child. In a long standing FBA the symptoms will be of delayed presentation with persistent cough or wheezing, recurrent or non-resolving pneumonia or, rarely, pneumothorax. Radiography (chest X-ray) has a low sensitivity and specificity in cases of translucent materials - however signs of emphysema and air trapping, atelectasis, infiltration and mediastinal shift may be seen in longstanding cases. A CT-scan is better at detecting metallic objects compared to plain X-ray but it is less useful in detecting organic material (translucent materials) [11]. Hence a negative CT-scan does not exclude an inhaled organic FB.

Management of FBA using a rigid bronchoscope is accepted as a gold standard for both diagnostic and therapeutic use. C.J.Killian (1887) was the first to do bronchoscopy to remove a FB (a bone) from the right main bronchus. It is easier to remove large volumes of granulation tissue which may (as in this case) develop around and even hide the foreign body; it is also easier to control the airway and bleeding. Flexible bronchoscopy can however be used, especially in adults [4]. The outcome depends on several factors including the patient's age, FB type, time of diagnosis, skills of the surgeon and anaesthetist, and availability of instruments [12].

### Conclusion

FBA is a very common presentation among children and a high index of suspicion is warranted especially when treating children with recurrent or non-resolving pneumonia. Failure to diagnose and remove FB may result into serious complications such as asphyxia, recurrent pneumonia, bronchiectasis, atelectasis and lung abscess in long standing cases. It is therefore important to gather a good history, radiological evidence, and sometimes, do a diagnostic bronchoscopy. Accurate and early diagnosis is crucial to prevent life threatening complications.

**Conflict of interest:** None

**Consent:** The parent consented for the case to be published.

**Authors' contributions:** JR received and assessed the patient, did the two bronchoscopies, did the literature review, and followed up the patient. MM assisted in the bronchoscopy and participated in literature review.

**Acknowledgement:** We appreciate the efforts of our nurses and colleagues in the department who participated in treatment of the patient.

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## QUIZ ON INFANT FEEDING

1. What is the definition of ‘exclusive breastfeeding’?
2. For how long does WHO recommend that a baby is exclusively breastfed?
3. List 3 advantages of breastfeeding.
4. How much salt should be added to an infant’s complementary foods?

See the new Lancet series on Breastfeeding at <http://www.thelancet.com/series/breastfeeding>

(answers in the next issue)

# News from the Poole Africa Link

Frankie Dormon, Medical Lead for the Poole Africa Link

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Figure 1. Dr James Elima, Director General at Lira Referral Hospital (centre) receives a few items of equipment from the Poole Africa Link team. He is holding a book on Critical Care and hopes that we will be able to help him to develop the 16-bed Critical Care Area, which is built, but not staffed (credit Frankie Dormon).



Figure 2. The team, from left to right, Pam Dumashie (midwife), Judy Mella (surgeon), Anna Agnes (midwifery tutor from Lira University), and Antoinette McAulay (paediatrician) are standing in the ward block of the maternity facility. Through the doors is a theatre, recovery unit, neonatal unit, and offices (credit Frankie Dormon).

October 2015 saw a change in direction for Poole Africa Link (PAL). Due to the political situation in South Sudan, the scheduled trip was diverted to Lira, Northern Uganda where there is a referral 500-bed hospital, and several schools of nursing. The one we used as our base was at a new University outside town, which currently has three intakes of midwifery students, (about 150 students in total). Funding is from the African World Bank and the Government is very supportive.

I and Peter McEwen met the Lira University team led by Professor Jasper Okwal-Okeng last year. We were hugely impressed by their enthusiasm and vision. In the past year they have finalised their plans for a new hospital, achieved a practising license for the soon-to-be-opened maternity hospital and forged very strong links with Lira Regional Referral Hospital.

This year we were warmly welcomed by both the hospital and university and spent many hours teaching at both places. We were a team of four, a midwife, surgeon, paediatrician and anaesthetist. We were impressed by the enthusiasm and knowledge base of the students. Many have worked in health care for some years and want to formalise their experiences and gain a good degree. The midwifery course is delivering a comprehensive curriculum

which will include training in additional skills, so that the midwives will be able to run a small health centre and deal with many clinical situations when there is no nearby doctor. They are learning more pharmacology, more nursing skills, and some extended roles including diagnosis and minor surgery. It is hoped that they will be able to provide basic anaesthesia including spinals, will have the necessary resuscitation skills and be able to perform some emergency surgeries.

We now need to look to the future and see this new addition to our charity as an ideal opportunity to continue with our support for South Sudan from a safer base, and, in addition, provide support to the new university. The government of Uganda are committed to help South Sudan, and the university is keen for us to develop training for their students and for students from South Sudan. By bus the border is only 3 hours away and Juba 6 hours. The political situation is stable, the accommodation easily available and cheaper, and the area safer for teams to visit.

We believe that the university would be an excellent base for training South Sudanese and local nurses and doctors. We would like to send senior trainees from UK in all specialties to gain experience of working in sub-Saharan Africa. There are clinical and teaching opportunities, and

Uganda has an excellent record of rolling out training to peripheral hospitals. The Safe Obstetrics course, Safe Paediatrics course, and Primary Trauma course have all been successfully rolled out with local doctors now providing much of the training. Short training courses are being delivered across Africa, including the surgical safety checklist, but these initiatives will be more successful if there are doctors on the ground to reinforce the messages. Lira has a huge need for people to help them to move forward. They have the infrastructure of wards, theatres, basic equipment but only 9 doctors when we were there (Figure 1).

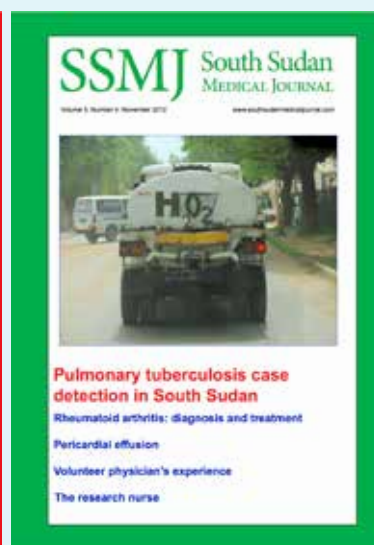
The next step for us is to approach the colleges to see whether they would be able to support such a project, and to raise funds for trainees to visit for 3-6 months supported by a consultant who would stay for 2-3 weeks, and then provide the mentorship from UK for the remainder of their stay. In addition we propose to approach various organisations to try to secure funding for South Sudanese

doctors and nurses to visit Lira for the short courses or the Midwifery 4-year course.

Lira University College is in early stages of development. The Faculty of Health Sciences has three intakes of midwifery students, with ambitious plans to develop training on-site, and clinical training at Lira Referral Hospital. The future sees a 200-bed hospital being developed on the site with further training and research opportunities. The University and the Referral Hospital have excellent links and a very good relationship. We see the two hospitals working well together into the future. The maternity facility is ready to open for outpatients and inpatients including a facility for Caesarean sections (Figure 2).

If anyone wishes to contact me regarding taking this project forward send an email to [frankie@pride.me.uk](mailto:frankie@pride.me.uk) and copy in Hilary Fenton Harris [Hilary.Fenton-Harris@poole.nhs.uk](mailto:Hilary.Fenton-Harris@poole.nhs.uk), the Link main contact. You can see more of our work on our website and on Facebook.

## SSMJ CALL FOR PUBLICATIONS



The South Sudan Medical Journal is calling for articles for publication on original researches, case reports, and clinical guidance in all the branches of medicine: internal medicine, surgery, obstetrics and gynaecology, general surgery, ophthalmology, ENT, orthopaedics, dermatology and general public health issues, as well as short news items of projects, organizations and people relevant to South Sudan. Letters to the editor and questions are also welcomed.

All contributors should read and follow the guidance provided in the SSMJ 'Information for Authors' on our website. Send your contributions to the Editor-in-Chief, Dr Edward Luka at [admin@southernsudanmedicaljournal.com](mailto:admin@southernsudanmedicaljournal.com).

# Resources

## MATERNAL AND CHILD HEALTH

### Recommendations for Prevention and Treatment of Maternal Peripartum Infections

This brief provides highlights and key messages from World Health Organization's recommendations for prevention and treatment of maternal peripartum infections, including policy and program implications for translating the guidelines into action at the country level. The ultimate goal of the WHO recommendations is to improve quality of care and to reduce preventable death and disability associated with peripartum infection for mothers and newborns. This brief (see – <http://bit.ly/1L8O1Zv>) is intended for policy-makers, programme managers, educators and providers. See the guidelines at [http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf?ua=1)

### INTERGROWTH-21st

The International Fetal and Newborn Growth Consortium for the 21st Century, or INTERGROWTH-21st, is a global, multidisciplinary network of more than 300 researchers and clinicians from 27 institutions in 18 countries worldwide and coordinated from the University of Oxford. It is dedicated to improving perinatal health globally and committed to reducing the millions of preventable newborn deaths that occur as a result of preterm birth or poor intrauterine growth.

This website provides clinicians and researchers access to the INTERGROWTH-21st Global Perinatal Package. This package is comprised of new, globally-validated standards and practical training resources. The following standards are available to download now:

Pregnancy Dating, Fetal Growth, Preterm Phenotype, Newborn Size, Neurodevelopment Assessment

These standards are paired with an expanding Training Toolkit and a rich body of literature on our methods. See <https://intergrowth21.tghn.org/>

### Hesperian free resources on pregnancy and neonatal care

These are available, both online and in print. They also have several priced books that cover these topics, including \*Where Women Have No Doctor, A Book for Midwives\* and \*Where There is No Doctor\*. These books are available for purchase on our web store (<http://store.hesperian.org/>), and also for free in many languages on our HealthWiki (<http://en.hesperian.org/hhg/Healthwiki>) and Resources by Language page (<http://hesperian.org/books-and-resources/language-list/>). Some helpful chapters to read on the HealthWiki include "Pregnancy and Birth" ([http://en.hesperian.org/hhg/New\\_Where\\_There\\_Is\\_No\\_Doctor:Chapter\\_26:\\_Pregnancy\\_and\\_Birth](http://en.hesperian.org/hhg/New_Where_There_Is_No_Doctor:Chapter_26:_Pregnancy_and_Birth)), "Newborn Babies and Breastfeeding" ([http://en.hesperian.org/hhg/New\\_Where\\_There\\_Is\\_No\\_Doctor:Chapter\\_27:\\_Newborn\\_Babies\\_and\\_Breastfeeding](http://en.hesperian.org/hhg/New_Where_There_Is_No_Doctor:Chapter_27:_Newborn_Babies_and_Breastfeeding)), chapters from \*The New Where There is No Doctor

[http://en.hesperian.org/hhg/New\\_Where\\_There\\_Is\\_No\\_Doctor](http://en.hesperian.org/hhg/New_Where_There_Is_No_Doctor))\*, and "The First Weeks After Birth" chapter from \*A Book for Midwives\* ([http://en.hesperian.org/hhg/A\\_Book\\_for\\_Midwives:Chapter\\_15:\\_The\\_first\\_weeks\\_after\\_the\\_birth](http://en.hesperian.org/hhg/A_Book_for_Midwives:Chapter_15:_The_first_weeks_after_the_birth)).

Hesperian also have a free app available for both iPhone and Android mobile devices, called "Safe Pregnancy and Birth". It is available for download through the Google Play store and the iTunes store.

## INFECTIONS

### Option B+ Monitoring & evaluation framework for antiretroviral treatment for pregnant and breastfeeding women living with HIV and their infants

Over the past decade, Prevention of Mother to Child HIV Transmission (PMTCT) programmes have rapidly evolved from delivering a single prophylactic drug to mothers to providing lifelong care and treatment for both mothers and children living with HIV. Lifelong treatment approaches-widely known as 'Option B+'-are expanding from pilots to universal implementation as revised national treatment guidelines are scaled up across generalized epidemic settings. This resource is intended for use among national M&E officers; PMTCT, paediatric, MNCH and HIV Care and Treatment programme managers; and other stakeholders (including donors, implementing partners, and civil society) in countries with generalized HIV epidemics and countries implementing the Option B/B+ approach to treatment. Using this framework, stakeholders can review, adapt and update current monitoring systems and continuously evaluate programmes, maximizing the potential impact of lifelong treatment programs to improve health outcomes and prevent HIV infections for women, their children and their families. See <http://www.emtct-iatt.org/m-and-e-framework/>

### The Lancet Clinic

This aims to cover 135 diseases selected according to Global Burden of Disease data and clinical practice needs - 45 are currently available. The Lancet Clinic will be regularly updated with a selection of the best clinical evidence from across The Lancet family of journals.

View The Lancet Clinic at [http://thelancet.com/clinical/diseases?utm\\_source=email&utm\\_medium=eTOC\\_TLID&utm\\_campaign=TheLancetClinic](http://thelancet.com/clinical/diseases?utm_source=email&utm_medium=eTOC_TLID&utm_campaign=TheLancetClinic)

## JUBA NATIONAL REFERRAL HOSPITAL ELECTRIFICATION APPEAL

**Power for the People** seeks funding to replace Juba Hospital's insufficient, erratic, diesel-based electricity supply with 24h x 7d, reliable, cost-effective, solar electricity.

Today South Sudan's only teaching and referral hospital, serving 11.7 million people, is plagued by acute shortage of electricity and daily power cuts. This costs lives and precious resources. Our project will replace this with ample, reliable, cost-effective solar power. The hospital can then operate an uninterrupted service, use diagnostic machines as needed, and expand services. Many more lives, and much precious resource, will be saved - like the baby fighting so bravely in the Premature Delivery Unit. The project will also create local skills, and reduce the hospital's carbon emissions by 90%.

**PLEASE DONATE NOW AND HELP US  
GIVE JUBA HOSPITAL THE POWER  
THEY NEED TO SAVE LIVES**  
<https://www.pfp.global>

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Power for the People CIO is a registered UK charity n° 162330



Every effort has been made to ensure that the information and the drug names and doses quoted in this Journal are correct. However readers are advised to check information and doses before making prescriptions. Unless otherwise stated the doses quoted are for adults.