**Surgical Outreach at the 57th West African College of Surgeons’ Conference: Advantages and Impact in Promoting Surgical Care in Rural Areas**

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**Abstract**

**Background:** In Burkina Faso, most of the population lives in rural areas. Health care workers are mainly nurses and most physicians are general practitioners. Patients in remote areas don’t have access to specialized care in their area of residence. Medical outreach is one strategy to address this issue particularly in developing countries.

**Aims and objectives:** This study aimed to report on the experience of a surgical outreach carried out in a Regional Hospital in Burkina Faso as part of the February, 2017 Annual Conference of the West African College of Surgeons in order to share the benefits of this model of care.

**Setting:** The outreach was carried out inthe regional hospital of Ouahigouya, about 180 km from the capital Ouagadougou.

**Materials and Methods:** Prior to the 57th Congress of the West African College of Surgeons in Ouagadougou, Burkina Faso, in February 2017, a surgical outreach was organized.Patients who underwent surgery during this outreach over a week were enrolled prospectively one month earlier.

**Results:** Twenty-four anesthetists (6 doctors, 18 nurses), and 23 surgeons (7 from Europe, Canada, USA, and Nigeria) participated. A total of 225 patients were screened and 100 had preanesthetic evaluationa week before surgery. Finally, 125 patients were operated on. A rapid pre-anesthetic evaluation was done on the day of surgery. The mean age of patients was 53.9 ± 19.8 years. Five patients were aged less than 14 years, 45 were elderly (aged 65 years or older) and 75 were aged between 15 to 64 years. The sex ratio was 1.1. Housewives constituted the commonest occupation. Majority, 71 (56.8%) of patients lived outside the city of Ouahigouya and 73 (58.4%) were ASA 1. Cataract extraction was the commonest procedure performed (in 65, 52% of patients). Sixty-eight (54.4%) of patients had surgery under local anesthesia. Surgery was ambulatory in 81 (64.8%) patients. Outreach surgery ended with a child of 2 years with acute respiratory distress after swallowing a coin which was successfully extracted. There were no serious peri-operative complications. One patient died from septic shock and respiratory distress following surgery for necrotic intestinal volvulus.

**Conclusion**: This was a safe, life-saving and free outreach surgery service, an example to promote in rural areas.

**Keys words:** outreach surgery, West African College of Surgeons, Burkina Faso

**Introduction**

Worldwide rural areas share common issues. Populations are dispersed and isolated, communication and transport are difficult, there are geographic and climatic barriers; all these make delivery of health care to these areas challenging.1 Most rural communities in both developed and developing countries have restricted access to health care services.2 There are not enough specialists in certain fields to provide prompt service to everyone who needs it in rural areas.3 Roads in poor condition, long distances to travel, lack of basic infrastructure, underutilization of available resources and poor organization are barriers that make rural patients likely to present late with advanced disease.4 Better mobilization of urban health workers to serve remote or underserved areas is a strategy to improve access to health care for this population. To enhance surgical care access, various strategies are implemented around the world. In Canada the government trains general practitioners to meet the basic surgical needs of rural populations.5 Outreach services are one of the possibilities to enhance access to health workers among other strategies such as mobile clinics, health caravans, telemedicine and, more recently, telephone-based strategies. Countries like Niger6, Nigeria3 and Togo7 have had successful experiences with surgical outreach. A policy of general practitioner in surgery training has been initiated in Burkina but the number of healthcare workers is still insufficient (3,000 medical doctors) particularly in rural areas.

In the year 2015, Burkina Faso statistical yearbook listed 1836 public health facilities: 4 university health centers, 9 regional hospitals, 47 medical centers with surgical units, 39 medical centers, 1694 health and social welfare centers and 43 offices for health workers. The private health system comprised 451 private health facilities, 15 Non-Governmental Organizations (NGO) for capacity-building in the 13 regions and 716 private pharmacies and dispensaries. In this context, the average coverage area of facilities (both public and private) was 6.4 km and their bed occupancy rate 53.2%. The availability of essential generic medicines and social welfare centers is 74.5%.8

This paper reports an experience of surgical outreach, under the West African College of Surgeons (WACS), in Ouahigouya in Burkina Faso.

**Patients and methods**

This prospective study was conducted between February 20th and 24th, 2017, in Ouahigouya in the northern region of Burkina Faso. Ouahigouya is a 16,414 km2 province 180 km from the capital Ouagadougou, and accounts for 8.5% of the country’s population. The WACS along with the government of Burkina Faso prepared this outreach program. The WACS provided surgeons (UK, Nigeria, Canada, and USA), medical equipment and disposables, and the government provided funds, facilities, anesthetists (doctors and nurses) and surgeons (both local and from Ouagadougou). Surgical care was free for patients but was paid for by the WACS committee and the Ministry of Health. The surgery was conducted in the main surgical unit which had three operating rooms equipped with mechanical ventilators and multiparameter monitors. The Gynecology/Obstetric operation room was not used because of power failure. The population was informed by radio and TV broadcasts, and pre-outreach visits in the regional hospital. During the pre-outreach visits, the hospital staff prepared the patients. Patients were screened by doctors two weeks beforehand. Hemoglobin estimation and blood grouping were obtained for every patient. Further investigations such as ultrasonography, and renal function tests were performed selectively. Where required, blood was pre-screened and cross-matched locally from consented donors (most were patients’ relatives).

During the 5-day outreach, sessions run dailyfrom 8.00am to 6.00pm. The first day was dedicated to getting local and visiting teams acquainted, technical set-up, patient screening and pre-anaesthetic assessment. The visiting team consisted of surgeons, nurses and laboratory scientists. The team was accommodated within 30 minutes’ drive from the hospital. Overall team activities were coordinated by a doctor anaesthetist. Patient follow up after the program was delegated to the local surgical team. For this report, patients’ biodata, diagnosis, investigation results, interventions performed and early outcomes(within outreach’ week) were prospectively collated and analyzed using Epi Info version 3.5.1.

Authorization and written informed participant consent were obtained from all major participants and involved patients.

**Results**

The surgical outreach team included 24 anesthetists, 23 surgeons and 2 ENT residents. Among the 49 participants, 26 were from Ouahigouya, 16 from Ouagadougou, 3 from the UK 2 from Nigeria and one each from Canada and the USA. The specialties covered were general surgery, gynaecology, urology, ENT and ophthalmology. Implants, disposables, and anesthesia drugs were brought by the WACSteam**.** The Burkina Ministry of Health requisitioned laboratory and pharmacy inputs to ensure free care for all.

The total number of patients operated upon was 125. General demographic and social characteristics of these patients are summarized in table I, as well as their ASA physical status. Five paediatric cases (<14 years), 45 elderly subjects (≥65 years) and 75 adults were recorded. The mean age of the patients was 53.9 ± 19.8 (range 3months to 90 years); the median age was 60 years. The mean age was 71.8 ± 9.4 years for elderly patients and 46.7 ± 14.5 for adults.

There were 67 males and 58 females. Most of the women, 56, were housewives accounting for 44.8% of beneficiaries; most of the men were farmers. Patients were categorised as ASA 1 in 73 (58.4%) and ASA 2 in 50 (40%). Fifty-four (43.2%) patients lived outside Ouahigouya. Table 1 below describes the socio-demographic and clinical characteristics of the patients.

**Table 1:** Demographic and clinical characteristics (n= 125)

|  |  |  |
| --- | --- | --- |
| **Variables** | **Number** | **Percentage** |
| Sex | Males | 67 | 53.8 |
| Females | 58 | 46.4 |
| Occupation | Farmer | 44 | 35.2 |
| Housewife | 56 | 44.8 |
| Public servant | 2 | 1.6 |
| Cattle breeder | 8 | 6.4 |
| Trader | 4 | 3.2 |
| Retiree | 2 | 1.6 |
| Private sector worker | 9 | 7.2 |
| Residency | Ouahigouya  | 71 | 56.8 |
| Outside Ouahigouya | 54 | 43.2 |
| ASA Score  | 1 | 73 | 58.4 |
| 2 | 50 | 40 |
| 3 | 1 | 0.8 |
| 4 | 1 | 0.8 |

**ASA:** American Society of Anesthesiology

Surgery was elective in 117 cases (93.6%) and emergency in 8 (6.4%). The emergencies included 5 trauma cases and one case each of testicular torsion and foreign body in the oesophagus. Table 2 gives the main diagnoses. We recorded one case each of circumcision request, of oesophageal foreign body, abdominal eventration, anal fistula, fractured radius, tibial fracture, ruptured ectopic pregnancy, parietal lumbar hernia, anorectal malformation and osteoid mandibular tumor; others were tympanic perforation, traumatic hand injury, bowel anastomotic leakage, benign lower-limb tumour, nasopharyngealtumour, volvulus of large intestine, hydrocephalus and a pseudo-arthrosis of right shoulder. There were two cases of intestinal fistulae.

**Table 2:** Pre-operative diagnoses of patients operated on (n =125)

|  |  |  |
| --- | --- | --- |
| **Diagnosis** | **Number** | **Percentage** |
| Cataract | 65 | 52 |
| Inguinal Hernia  | 16 | 12.8 |
| Vesico-vaginal fistula | 8 | 6.4 |
| Uterine myomas | 4 | 3.2 |
| Genital prolapse | 4 | 3.2 |
| Ovarian cyst | 3 | 2.4 |
| Hydrocele | 2 | 1.6 |
| Cystocele | 2 | 1.6 |
| Othersa | 21 | 8.8 |

a: these included one case eachof the following: circumcision request, oesophageal foreign body, abdominal eventration, anal fistula, intestinal fistula (2 cases), fractured radius, tibial fracture, ruptured ectopic pregnancy, parietal lumbar hernia, anorectal malformation, osteoid tumour of the mandible, tympanic perforation, traumatic hand injury, bowel anastomotic leakage, torsion of testis, benign lower limb tumour, nasopharyngeal tumor, volvulus of large intestine, hydrocephalus, pseudo-arthrosis of right shoulder.

Cataract extraction was performed under local anaesthesia in 65 (52%) patients. Spinal anaesthesia was performed in 43 (34.4%) and general anaesthesia in 14 (11.2%). Two cases of failed spinal anesthesia were converted to general anaesthesia. Preoperative antibiotic-prophylaxis was systematically administered consisting of 30 milligrams per kg of ceftriaxone intravenously prior to incision. Surgery was ambulatory in 81 (64.8%) and 44 (35.2%) were in-patients.

Cataract extraction was the commonest procedure performed, 65 (52%) followed by inguinal hernia repair in 16 cases (12.8%). There was one case of removal of osteosynthesis material, one arthrolysis of shoulder, two intestinal fistula repairs, two hydrocele repairs, one ventriculoperitoneal shunt placement, one extraction of a foreign body, one abdominal eventration repair**,** one tendinoplasty of leg for traumatic rupture of tendon (achilles tendon)**,** two cases of biopsy of bladder tumor previously diagnosed as VVF and one tympanoplasty. The ruptured ectopic pregnancy had a laparotomy with salpingectomy.

**Table 3:** Distribution of surgical operations (n =125)

|  |  |  |
| --- | --- | --- |
| **Surgery**  | **Number** | **Percentage** |
| Phaco emulsification A+ *PCI****e*** | 65 | 52 |
| Inguinal hernia repair | 16 | 12.8 |
| Vaginal Hysterectomy with Pelvic Floor Repair | 6 | 4.8 |
| Abdominal hysterectomy (±Salpingo-oophorectomy) | 2 | 1.6 |
| Vesico vaginal fistula (VVF) repair | 6 | 4.8 |
| Tumor biopsy | 3 | 2.4 |
| Abdominal hernia surgery | 3 | 2.4 |
| Myomectomy  | 3 | 2.4 |
| Cystectomy | 2 | 1.6 |
| Osteosynthesis | 2 | 1.6 |
| others**a** | 17 | 13.6 |
| Total | 125 | 100 |

ePCI: Posterior chamber implants

**a**: circumcision = 1, removal of oesophageal foreign body = 1, fistulectomy for anal fistula= 1, ~~pre Chilean fistula= 1~~, repair of parietal lumbar hernia= 1, colostomy for anorectal malformation= 1,tympanoplasty of tympanic perforation= 1, repair of traumatic injury of the hand= 1, detorsion of testicular torsion= 1, placement of ventriculoperitoneal shunt for hydrocephalus = 1 ; abdominal eventration repair = 1, intestinal fistula repair = 2, salpingectomy for ruptured ectopic pregnancy = 1, bowel anastomotic leakage = 1, nasopharyngeal tumor biopsy = 1, laparotomy for volvulus of large intestine = 1, arthrolysis for pseudo-arthrosis of right shoulder = 1.

Among the 8 cases of VVF diagnoses, six were really VVFs and 2 were bladder tumors (mentioned above)with locoregional extension; the 6 women with VVF had successful repairs. Women who presented with genital prolapse (4 cases) and cystocele (2 cases) had vaginal hysterectomy with pelvic floor repair. Three of the women who had uterine fibroids had myomectomy done and one had total abdominal hysterectomy. Two of the women with ovarian cysts had ovarian cystectomy done while the third had total abdominal hysterectomy with bilateral salpingo-oophorectomy. One case of anal fistula hadfistulectomy.Colostomy for anorectal malformation, repair of bowel anastomotic leakage, detorsion of testicular torsion, repair of traumatic injury of the hand and biopsy of nasopharyngeal tumor were done in the appropriate cases. Table 3 lists the distribution of surgical procedures performed.

There were no serious peri-operative complications: 2 women had nausea and vomiting when placed in the Trendelenburg position for vesico-vaginal fistula repair under spinal anaesthesia. Reversal of the Trendelenburg position and the administration of anti-emetics relieved the symptom. Two patients had pruritus which responded to intravenous dexamethasone administration. One patient had urinary retention which was managed with temporary insertion of urinary catheter. The medium length of hospital stay was one day.

One patient died from septic shock and respiratory distress following surgery for necrotic intestinal volvulus. The lack of intensive care facility in this hospital hindered successful management but the family refused referral to another hospital because they couldn’t afford it.

This campaign enabled the population to benefit from free specialized surgical care to which they did not have access under normal circumstances. In fact, 77 (61.6%) of surgery procedures performed were usually not accessible locally.

***Special case report***

The surgical outreach ended with a 2-year-old child with a foreign body in the oesophagus (a 2.5 cm 200 CFA coin) impacted 24 hours before admission. The child was referred from a private clinic for a chest x-ray for dyspnoea. The X-ray showed the foreign body (Fig 1) and rapid sequence anaesthesia induction was done. The coin was extracted within 5 minutes without incident and the child did well thereafter. The coin was returned to the mother!



**Figure 1**: Chest X-Ray of 2 year-old child with 200 CFA coin in the oesophagus

**Discussion**

Burkina Faso is a third world country with a population of 19.5 million people, 70.1% of whom live in rural areas Ouahigouya represents 8.5% of the national population. The country’s health system consists of various levels, each of which is designed to provide a range of services: the peripheral, the lower intermediate, the upper intermediate and the central levels.9 At the time of this report there were in the Ouahigouya regional hospital 3 obstetricians, 3 general surgeons, and one orthopaedic surgeon. Reliable access to surgery for the population in rural areas is a pre-occupation of the government.

During the rural surgical outreach, 125 patients benefited from surgery in 5 days, i.e. on average 25 patients per day. This was made possible by the presence of many surgeons. Nearly half of the patients came from out of town (43.2%). As treatment had been announced to be free of charge several patients came from as far away as the Ivory Cost and Mali. This means that patients had concerns about their disease but because of non-affordability they never had medical care. The literature estimates that unaddressed surgical conditions cause 20% of deaths.10 Patients aged 65 or older represented 36% of those operated on. The rural population is aging in developing countries.11 They are poor and can be expected to increase surgical demands and hospital admissions in the future.12,13 Unaddressed, this population can be expected to account for 75% of future mortality in low-resource nations.12 Children accounted for only 4% of operations in our study.

Patients were subsistence farmers (35.2%), housewives (44.8%), or traders; this reflects the low socio-economic status of the rural population. This social group lacks reliable health insurance there being no universal health insurance in Burkina Faso.13 Only pregnant women and children up to five years of age have benefitted from insurance coverage since 2016. The lack of health insurance is the major issue in developing countries.3 Cataract extraction, the most common operation performed is highly prevalent worldwide particularly in low-resource nations.14 Hernia was the second most common condition treated. In Africa, the yearly incidence of ~~a~~ hernia reaches approximately 175 per 100,000 but only approximately 14.3% of inguinal hernias are repaired, despite the demonstrated benefits of elective hernia repair in reducing mortality and morbidity.15 Rural dwellers are not able to take time off work for elective hernia repair at a distant hospital but prefer to consult first traditional healers in the hands of whom they risk bacterial infection. Vesico-vaginal fistula represented 6.4% of patients. It is a devastating condition leading to social isolation, marital disharmony, divorce, rejection by families and relatives and severe psychological trauma.16 It was related to obstetrical complications in our study, which is usually the case in developing countries.17 The local urologist treated them successfully with the help of two skilled and experienced surgeons. Eight (6.4%) of the surgeries were emergencies. Ojo et al in Nigeria reported 94 (10.4%) emergency procedures including bowel obstruction, acute appendicitis, prolonged obstructed labor, injuries and septic complications.3 Emergencies and treatment of surgical complications constitute the bulk of surgical activity in developing countries.18 The only death in this outreach may have been avoided if intensive care facilities were available.

Worldwide without surgical and obstetrical services, approximately 10% of the population die from injury, and 5% of pregnancies result in maternal deaths.10 Anaesthesia remains a major limitation to the provision of essential surgical services in low-resource nations due to the shortage of trained personnel, equipment, supplies and suboptimal drug storage facilities.13,16 In this outreach 24 anaesthetists (6 physicians, 18 nurses) participated. During outreach surgery, preoperative anaesthesia assessment must employ skilled clinical judgement to ensure patient safety. The situation in our study was not optimal but can be explained by the lack of personnel. Local and spinal anaesthesia reduce surgical morbidity as compared with general anesthesia in developing countries where anaesthetic drugs and resources are scarce. The anaesthetists of Ouahigouya had an opportunity to see the practice of Total IntraVenous Anaesthesiaand rapid sequence induction techniques**.** Majority of the cases were ambulatory and the length of stay for hospitalized cases was short.

Our report shows that a surgical specialist outreach can fast-track the provision of surgical care to a large number of patients and overcome obstacles to quality healthcare in the area concerned. It provided opportunities to improve the skills and knowledge of local surgeons and residents. The interactions of local surgeons with surgeons from other countries provided the basis for future collaboration. The outreach ended with saving the life of a child who had swallowed 200 f CFA coin and who would otherwise have had to travel to Ouagadougou for care.The benefits of outreach surgery are recognized by many authors.19 It has benefits to patients and health systems3,8by allowing free of charge care and resolving geographical problems. The success of this exercise will enable us promote outreach surgery in Burkina Faso where health resources are very limited. Each year our country organises a rotating celebration of national day in the regions. An outreach programme can be initiated in connection with the celebrations to improve availability of specialized care nationwide. So by creating a mobile surgical team financed by the government, Burkina Faso could extend health insurance to elective surgery in addition to maternal and child health insurance already being implemented.

**Conclusion**

 This outreach surgery programme was very successful. It allowed many patients, within a short period of time, to access specialized care when they would not have had access under normal circumstances. Such programmes need to be promoted in Burkina Faso in order to facilitate access to safe, life-saving care in the rural setting.

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