**Title: Staggered Free Surgical Outreach Approach: A Viable Option of Outreach During Covid-19 Pandemic**

**Abubakar Sadiq Muhammad**1,2 **Khalid Abdullahi**1, **Haruna Usman Kamba**1 **Abubakar Isyaku**1 **Mikailu Abdullahi**1**, Isah Abdullahi1**1

1Department of Surgery, Usmanu Danfodiyo University Teaching Hospital, Sokoto

2Department of Surgery, IMAN Hospital RunjinSambo, Sokoto, Nigeria.

**Corresponding author:**
Departments of Surgery IMAN Hospital Runjin Sambo and, Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria

asgusau@gmail.com

08035963024

**Post code- 840001**

**Orcid no:** **https://orcid.org/0000-0002-0404-9042**

**Abstract**

**Background:**

One of the regular programs organized by Islamic Medical Association of Nigeria (IMAN) is medical outreach in which patients are treated free of charge. This laudable program has been hampered by Covid-19 pandemic. We devised a staggered outreach protocol to cater for a limited number of medical and surgical patients at a time for few weeks under Covid-19 preventive measures compliance.

The objective of this study is to report on IMAN staggered surgical outreach by IMAN.

**Method:**

This is a retrospective study of 2-week staggered surgical outreach conducted by IMAN at IMAN Hospital Sokoto. Data was collected via a proforma and analyzed using SPSS 25 version. The results were presented in percentage, mean± standard deviation, tables and charts.

**Results:**

There were 27 patients who had surgical interventions during the staggered surgical outreach with mean age of 41.5 ± 22.0 years and a range of 4 to 90 years. The male to female ratio was 26:1.

The cases seen were hernia (33.3%) ± benign prostatic hyperplasia, lipoma (18.5%), hydrocele (14.8%), testicular tumour (7.4%), subacute appendicitis (3.7%) and ganglion cyst (3.7%).

The surgical interventions offered were herniorrhaphy (33.3%), excisional biopsy (22.2%), herniotomy (14.8%), hydrocelectomy (7.4%), orchidectomy (7.4%), prostate biopsy (7.4%) and appendicectomy (3.7%). One patient developed hematocoele post herniorrhaphy which was drained.

**Conclusion:**

Staggered surgical outreach is a viable option for free surgical outreach. Hernia, hydrocoele, lipoma, testicular tumour and appendicitis can be operated with good outcome.

**Keywords**: staggered outreach, Surgery, Covid-19 pandemic

Running title: Staggered Surgical Outreach in Covid-19 Pandemic

**Introduction**:

Surgical outreach to needy and underserved populations is being conducted by many organisations such as Nigerian Medical Association (NMA), Islamic Medical Association of Nigeria (IMAN) and International Humanitarian Organisations 1. This has been hampered by Covid-19 pandemic which led to deterioration of many of the patients that could have benefitted from the services. Since the onset of the pandemic, there has been increased number of recorded unexplained deaths due to scaly down of services for medical and surgical conditions in amost all the hospitals 2. At the initial phase of the pandemic health workers were thrown into confusion due to fear of contracting the disease in the course of their duty. With time, this perception changed due to many training and seminars organized on the management of Covid-19 pandemic. Also, the health workers learnt how to conduct themselves even where the chance of contracting the pandemic was high1. It was observed that health workers that observe preventive measures such as wearing of face masks, hand washing with sanitizers, physical distancing did not contract Covid-19 even when they passed through them. Most of the current recommendations suggest suspension of elective cases34. Some elective cases such as hernia have a tendency of becoming incarcerated and obstructed in the long run. This is the commonest surgical condition operated during surgical outreaches.

No study has been done to assess the modality of carrying out outreaches in our environment during Covid19 pandemic. We devised a staggered outreach where a limited number of patients will be screened and operated at different times. This study is done to assess the surgical procedures and their outcome during staggered outreach by IMAN.

**Methods**

This is a retrospective study of 2-week staggered surgical outreach carried out by IMAN UDUTH/ UDUS at IMAN Hospital from 17th - 31st October, 2020. The cases advertised were minor and intermediate surgical conditions that may be done as day cases or may require short admission. These included hernia, hydrocoele, lipoma, ganglion cyst and varicocele. The data collected include biodata, diagnosis, results of investigations, types of procedure, anaesthesia, admission and outcome.

The inclusion criteria were minor or intermediate surgical conditions that will last not more than one hour and can be done under local anesthesia, spinal anaesthesia or ketamine. Patients excluded included patients with poorly controlled hypertension or diabetes, anaemia, respiratory tract infections, and patients reactive to serological markers for human immunodeficiency virus and hepatitis. Data was analyzed using Statistical Software for Social Sciences (SPSS) version 25.0. The results were presented in percentage, mean ± SD, tables and charts. The study was approved by the Research Ethical Committee of IMAN Hospital.

**Staggered Free Surgical Outreach Protocol by IMAN**

Advertisements of selected cases were sent through the IMAN WhatsApp platform, IMAN gatherings and associates. Submission of patient’s names and phone contact were done at IMAN secretariat and IMAN Hospital. The patients were evaluated and screened in batches based on the cases of interest and guided by inclusion and exclusion criteria. A list patient was generated a week before commencement of the outreach. Advertisement for volunteers was done which included surgeons, nurses, anesthetist, laboratory staff, pharmacists and cleaners. Logistics were taken care of by the executives of the IMAN who were also responsible for assessment and provision of all the things required for surgery and feeding of the participants. Two surgeons operated at a time and up to 5 cases were operated per day. Different people were assigned to different days and time to avoid overcrowding.

The surgical outreach team was divided into 4 groups, logistics, screening, pre-operative, and postoperative surgical teams. The postoperative team was responsible for postoperative management which included administration of intravenous fluids, analgesia, antibiotics and monitoring. Patients were seen on one day postoperative for assessment of early complications and overall outcome. The stitches were removed on postoperative day seven.

**Results**:

There were 27 patients who had surgical interventions during the staggered surgical outreach with mean age of 41.5 ± 22.0 years and a range of 4 to 90 years. There were 26 male (96.3%) and1 female (3.7%), with male to female ratio of 26:1. Ten (10) patients (37%) were unemployed and 6 patients (22.2%) were children under care. Other details of the patient’s occupation are shown in table 1 below.

The commonest surgical condition operated was hernia in 8 patients (29.7%). Other details of the surgical cases operated during the outreach are shown in figure one below. Nineteen (19) patients (70.3%) required urgent intervention due to incarcerated or obstructed hernia (33.3%), appendicitis (3.7%), suspicion of malignancy (22.2%) and infective process with suppuration (11.1%).

There were 29 surgical interventions carried out in 27 patients. The commonest surgical intervention carried out was herniorrhaphy in 9 patients (31.1%). Other surgical interventions carried out are shown in figure 2 below. Local anesthesia (xylocaine + adrenaline) was used for 14 cases (48.3%), spinal anesthesia in 8 cases (27.6%) and ketamine in 7 cases (24.1%).

**Post-operative management**

Twenty-five (25) patients were discharged on the same day of the surgery, 2 patients with obstructed hernia had a day admission and patients with appendicitis had admission for three days. Patients were given maintenance intravenous normal saline, intramuscular diclofenac and broad-spectrum antibiotics, initially 1g of ceftriaxone but on discharge drugs were converted to oral diclofenac amoxicillin or ciprofloxacin. Patients were reviewed 1week post-operative and stitches were removed from those patients with non-absorbable sutures. One patient developed hematocele post herniorrhaphy which was drained. The histology of the patients with a toe mass that was thought to be ganglion cyst confirmed giant cell carcinoma of the tendon sheath. Testicular masses revealed tumor calcinosis and granulomatous orchitis. Prostate biopsy and excisional biopsy specimens for lipoma were benign.

**Discussion:**

Coronavirus infection is a respiratory disease caused by Novel SARS-CoV-2 virus discovered in Wuhan province in December, 2019 and WHO declared the disease pandemic in March, 20203. It is spread by contact with infected people, surface or material4. Overcrowding, enclosed space, anesthesia that requires the close contact may increase the spread. Hand washing, use of face mask, hand sanitizers, face shield, physical distancing are the preventive measures3. Early guidelines encouraged outpatients’ services and elective services in favor of emergencies14.

Free surgical outreaches is novel programs run by charitable organizations to cater for the health care services of the needy and less privileged people1. This has been impacted negatively by the Covid-19 pandemic. In Nigeria increased deaths have been reported which were partly attributed to lack of care of the medical and surgical conditions which could have been avoided if there was structure to cater for them52. Majority of these individuals cannot pay for their health bill therefore depends on organizations like IMAN for intervention.

We devised the Staggered Free Surgical Outreach to see the feasibility of expanding it to cater for more cases including medical cases. This serves as pilot study for the subsequent outreaches.

The mean age of the patients in this study of 41.5 years is higher than 35.2 years and 38 years reported by Ojo et al 6 and Isichei et al 7in Jalingo and Jos respectively. But the age ranges were comparable, 4-90 years vs 1 month to 90 years2. Their study was done in a rural community while our own was done in an urban area. Majority of our patients (81.5%) were not gainfully employed hence they are dependent on this kind of mission for the treatment of their conditions. The male female ratio of 26: 1 is much higher than 1.7:1 reported by the previous studies 6,7 as it has a higher number of patients and is open unlike our own that is controlled due to Covid-19 pandemic.

The spectrum of cases in this outreach is comparable to the one reported by Ojo et al 6and isichei et al7 in rural communities. They operated on hernia, hydrocoele, appendicectomy, orchidectomies, goiters and lump excision. There was no mortality recorded as in this study. However, they recorded higher complication rate that include surgical site infection (5.1%), scrotal hematoma (0.7%), hemorrhage (0.3%) and wound dehiscence (0.3%). The rate of scrotal hematoma in this study was 3.4%. The scrotal hematoma was found in one patient in this study as opposed to 6 patients in the previous study. Although, their rate was lower due to much higher number of patients or procedures in their studies. In a study by Isichei et al7 the reported surgical site infection rate was 2.65% with no mortality.

The use of spinal, general and local anesthesia was comparable in the 2 studies6,7. They use general, spinal and local anesthesia in 7.6%, 34.3% and 58.2% respectively as compared to our study where general, spinal and local anesthesia were used in 24.1%, 27.6% and 48.3% respectively.

Some of the cases treated in this study were incarcerated or obstructed hernia, suppurative cases or potentially malignant cases which if not done can lead to mortality. Most recommendations recommended suspension of elective cases4,8, but advocated repair of hernias and cases that have potential for complications in the long run. Staggered surgical outreach is potentially a promising and viable method of outreach during Covid-19 pandemic. We advocate it for similar organizations. We hope to continue with the approach for both medical and surgical cases.

**Conclusion:**

Staggered free surgical outreach is a feasible and viable option of outreach in the period of Covid-19 Pandemic. Minor and intermediate surgical cases that comprise hernia, hydrocoele, lipoma, testicular tumor and varicocele can be operated with good outcome without spread of Covid-19 infection. This will help to cater for the underserved, needy and less privileged part of a society.

**Declarations:**

**Author’s contribution:**

Muhammad AS- conception, design, data acquisition, data analysis, data interpretation, writing of the manuscript, review for critical contents

Khalid A- data acquisition, writing, data interpretation

Kamba HU- data acquisition, review

Isyaky A- data acquisition, review

Abdullahi M- data acquisition, review

Abdullahi I- data acquisition, review

**Declarations:**

**Accessibility of data**- data is available with the corresponding whenever requested.

**Acknowledgement**- Prof. Aminu Mode, Department of Modern European Language and Linguistics for grammatical corrections

**Accessibility of data and materials**- data is available with the corresponding whenever requested.

**Financial support and sponsorship**: none

**Conflict on interest-** no conflict of interest to declare by all the authors

**Ethical approval and inform consent**- The study was approved by the ethical committee of IMAN Hospital Runjin Sambo, Sokoto, Nigeria.

**Consent for publication-** consent for publications was obtained from the patients whose images or intraoperative pictures were taken.

**References:**

1. Kynes JM. Surgical Outreach for Children by International Humanitarian Organizations : A Review. 2017;1–10.

2. Muhammad G. Nigeria Kano State’s rise in deaths not due tocoronavirus- state government. [Internet]. REUTERS. April 2020. cited 26-12-2020. available form:www.reuters.com.

3. Alsofyani MA, Malaekah HM, Bashawyah A, Bawazeer M, Akkour K, Alsalmi S, et al. Safety measures for COVID-19 : a review of surgical preparedness at four major medical centres in Saudi Arabia. 2020;1–14.

4. Prakash L, Dhar SA, Mushtaq M. COVID-19 in the operating room : a review of evolving safety protocols. 2020;1–8.

5. France Press Agency. Mysterious mass death in Nigeria related to Covid-19. [Internet]. Daily Sabah.May, 04,2020.cited 26-12-2020. Available from: www.dailysabah.com/africa. com

6. OjoE, Okoi E, Umoiyoho AJ NM. Surgical outreach program in poor rural Nigerian communities. Rural Remote Health. 2013;13(1):2200.

7. Isichei MW, Misauno MA, Shitta AH, Isichei CO, EK. Cost Effectiveness of Surgical Outreach Compared with Routine Surgeries at Facility in Jos, Nigeria. IOSR J Dent Medical Sci. 2014;13(4):53–4.

8. Moletta L, Pierobon ES, Capovilla G, Costantini M, Salvador R, Merigliano S, et al. International guidelines and recommendations for surgery during Covid-19 pandemic: A Systematic Review. Int J Surg. 2020;79(January):80–8.

**Legend for table and figures**

**Legend for Tables**

Table 1: Distribution of Patients Occupation

**Legend for figures**

Figure 1: Distribution of Patients Diagnosis

Figure 2: Distribution of Patients Surgical interventions

**Table 1: Distribution of Patients Occupation**

|  |  |  |
| --- | --- | --- |
| **Occupation** | **Number of patients n= 27** | **Percentage (%)** |
| **Unemployed** | 10 | 37.1 |
| **Under care** | 6 | 22.2 |
| **Civil servant** | 4 | 14.8 |
| **Inmate**  | 4 | 14.8 |
| **Tailor**  | 1 | 3.7 |
| **Security personnel** | 1 | 3.7 |
| **Trading** | 1 | 3.7 |
| **Total** | 27 | 100 |

**Figure 1: Distribution of Patients Diagnosis**

**Figure 2: Distribution of Patients Surgical interventions**