

Day Case Surgery – Experience from a Nigerian Orthopaedic Hospital

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Abstract

Aim: To study the scope, rate, safety and problems of general ward-based day case orthopaedic surgery.

Methods: A five-year retrospective review.

Results: Procedures were minor or intermediate. The day case surgery rate, the substitution indices for selected procedures and selected

clinical indicators of safety were low. Accidents and emergency beds were used to admit four day cases.

Conclusion: The day case surgery rate can be improved by performing more of the basket of procedures as day cases. The current practice appears safe but was associated with instances of block of Accident and Emergency beds.

Keywords: Day case surgery; Ambulatory surgery; Orthopaedic surgery; Nigeria; Developing country..

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Introduction

Day case surgery (DCS) is the practice of admitting carefully selected and prepared patients into hospital on the day of operation for a planned, non-emergency surgical procedure and discharging them within hours of that surgery on the same working day [1]. It has been well documented that with proper patient selection and preparation DCS provides high quality, safe and cost-effective surgical care associated with high level of patient satisfaction [1, 2, 3].

In the developing world, the benefits of DCS are being exploited within various surgical specialties despite the suboptimal nature of complementary services [4] and technological development and the prevalence of general ward-based hospital-integrated practice, the least desirable model of DCS organization [5]. Studies of DCS in paediatric surgery [6, 7], plastic surgery [8] and urology [9] have been reported from Nigeria. We are aware of only one study from Nigeria on DCS in orthopaedic practice [10] even though orthopaedic procedures are part of multispecialty reports [3]. It is unlikely that a proper perspective of day case surgery practice in a specialty can be obtained from multispecialty studies.

National Orthopaedic Hospital, Dala, Kano, located in Northwestern zone of Nigeria with about 36 million inhabitants according to the 2006 population census, is a tertiary hospital which serves as a referral centre for the zone, other northern states and the Federal capital territory. This five-year retrospective descriptive study was aimed at evaluating the utilization, scope, safety and problems of day case orthopaedic surgery based on admission of patients into general wards in the hospital.

Methods

Case folders of patients who had day case orthopaedic procedures between January 2006 and December 2010 were retrieved. The total number of elective operations (including day cases) was obtained from the operation registers. Manipulations of congenital talipes equinovarus and removal of external fixators which did not require anaesthesia were excluded as they could have been performed in the out-patient clinic without the need for admission. Such procedures are often excluded for statistical purposes [1].

Patients were assessed and selected for DCS at the outpatient clinic by consultants who initiated requisite preparation. They were accompanied by a responsible adult and admitted on the morning of the procedures into any ward with available beds from where they were taken to theatre. Each operating team used the same table for day cases and in-patients. Day cases were not routinely operated before in-patients. Patients were observed in the theatre recovery room before they were returned to the ward. All patients were discharged from the ward to the care of their escort after senior residents had assessed them and found them fit for discharge.

Data were extracted on age, sex, domiciliary address, evidence of GSM phone documentation, ward used for admission, ASA grade, type of anaesthesia, procedure performed, surgeon's rank, direct admission and re-admission with reasons, complications, mortality and follow-up. Epi Info version 3.5.1 was used for data analysis. Descriptive statistics and tables were used for data presentation. The substitution index was calculated as the percentage of day case surgical intervention in relation to the total number of all surgical interventions (day case and in-patient operations) for some selected procedures [11].

Results

Records of 243 patients were retrieved. Sixty four patients were excluded in accordance with the exclusion criterion, leaving 179 patients comprising 119 (66.5%) males and 60 (33.5%) females. The median age was 25 years (range= 4 weeks – 78 years). One hundred and thirty eight (77.1%) patients lived within one hour's drive from the hospital. GSM phone numbers were documented for 101 (56.4%) patients. Four (2.2%) patients were admitted onto beds in the Accident and Emergency unit of the hospital. The median timing of the first postoperative visit was 14 (range= 0 – 60) days. The median duration of follow-up was 4 weeks (range= 0 – 140) weeks. Thirty seven (20.7%) patients were lost to follow-up.

One patient had manipulation under anaesthesia four times while another had it three times. One hundred and eighty four procedures were therefore done in the 179 patients. Two DCS rates were calculated (Table 1). Table 2 shows the scope of procedures performed: twenty one (11.4%) were performed by consultants; 152 (82.6%), by senior residents; and 11 (5.9%), by junior residents.

Table 1 Orthopaedic DCS rates.

Procedures considered	Number of Procedures	Number of in-patient operations	Total number of elective operations	DCS rate (%)
Procedures included in study only	184	5105	5289	3.48
Included and excluded procedures	248	5105	5353	4.63

Table 2 The scope of day case orthopaedic procedures performed.

Procedure	Number	Percentage
Biopsy	49	26.6
Removal of implants	35	19.0
Closed reduction of fractures and dislocations	17	9.2
Manipulation under anaesthesia	13	7.1
Surgical release	10	5.4
Tendon procedures	10	5.4
Refashioning/Amputation of finger or toe	10	5.4
Open reduction/osteoclasia and Kirschner wire fixation	9	4.9
Bone drilling/curettage/nibbling/decortifications	6	3.3
Excision of corn, ganglion, infected callosity, infected bursa, or pyogenic granuloma	5	2.7
Removal of foreign body	5	2.7
Adjustment or removal of external fixator	5	2.7
Wedge excision of toe-nail with bed and matrix	3	1.6
Excision of extral digits	2	1.1
Sequestrectomy	2	1.1
Soft tissue release	1	0.5
Split thickness skin grafting	1	0.5
Partial fibulectomy and Intramedullary tibial nail adjustment	1	0.5
TOTAL	184	100.0

Biopsy and implant removal accounted for nearly half of the procedures. Chronic leg ulcers, bone and soft tissue tumours, a calcified subcutaneous nodule and an ulcerative mycetoma were biopsied. There were 34 (69.4%) incision biopsies, 14 (28.6%) excision biopsies and one synovial biopsy for suspected tuberculous

synovitis in the knee. Table 3 shows the distribution of types of implants removed, indications for surgical release and types of tendon procedures. For some of the procedures presented in Table 3, substitution indices were calculated (Table 4).

Table 3 Implants removed, indications for surgical release and scope of tendon procedures.

Procedure	Number	Percentage
Implants removed		
Kirschner wires	22	62.8
Syndesmotic screws	4	11.4
Plate and screws	3	8.6
Rush nail	2	5.7
Locking screws	2	5.7
Tibial intramedullary nail	1	2.9
Knowles pin	1	2.9
TOTAL	35	100.0
Surgical Release		
de Quervain disease	6	60.0
Trigger thumb	2	20.0
Trigger thumb and finger	1	10.0
Carpal tunnel syndrome	1	10.0
TOTAL	10	100.0
Tendon Operations		
Open elongation of tendon Achilles	4	40.0
Percutaneous Achilles tenotomy	4	40.0
Extensor tendon repair for mallet finger	1	10.0
Extensor tendon repair following traumatic rupture	1	10.0
TOTAL	10	100.0

Table 4 Substitution indices for selected procedures.

Procedure	Day Case Surgery	In-patient surgery	Total elective cases	Substitution index (%)
Removal of plates and screws	3	72	75	4.0
Removal of intramedullary nails	1	19	20	5.0
Elongation of tendon Achilles	4	62	66	6.1
Tendon repair	2	16	18	11.1
Carpal tunnel release	1	3	4	25.0

Most of the patients were ASA I or II. There were 2 ASA III patients: a 30-year old male with chondrosarcoma of the proximal humerus who had incision biopsy done and a 72-year old female with anterior chest wall lipoma who had excision biopsy done. General anaesthesia and local anaesthesia were used for 142 (77.2%) and 40 (21.7%) procedures respectively. One (0.5%) procedure was done under spinal anaesthesia. A Bier's block was done for carpal tunnel release. Propofol was used in 47 (33.1%) of 142 procedures performed under general anaesthesia.

Six patients who had one procedure each required in-patient admission, giving a direct admission rate of 3.3%. Reasons for admission were indebtedness, drowsiness, bleeding from the operation site, and late operation following each of 4 procedures. No reasons were documented for 2 procedures. Four types of complications (Table 5) occurred after 5 procedures, giving a complication rate of 2.7%.

Table 5 Complications of 184 day case procedures.

Complication	Number	Procedure
Wound infection	2	Excisional biopsy, Incisional biopsy
Wound dehiscence	1	Finger refashioning
Post-operative pain	1	Incisional biopsy
Post-operative surgical site bleeding	1	Removal of intramedullary tibia nail
Carpal tunnel release	1	3

Discussion

Biopsy, mainly incision biopsy, was the commonest procedure performed followed by removal of implants. The biopsy rate of 26.6% is similar to the 35% reported by Adewole et al [10] but theirs was predominantly excision biopsy. They reported 2 internal fixations of forearm fractures with plates and screws; only Kirschner wire fixation was done in our study. The scope of orthopaedic procedures is, however, similar in both studies. Some orthopaedic procedures that are not currently being done as day cases in Nigeria include diagnostic and therapeutic knee arthroscopy, discectomy and subacromial decompression. This is likely explained by the limited development of minimal access orthopaedic surgery in the country. There is a need to increase the scope of procedures but not at the expense of safety and quality of care.

We found a DCS rate of 3.48%. Even when we included procedures that are normally excluded for statistical purposes we still obtained a rate of 4.63%. This low rate contrasts markedly with 68.03%, 37.3% and 51% reported from Nigeria for paediatric surgery [7], plastic surgery [8] and urology [9] respectively. A multispecialty study [3] found a rate of 30.4% even though it is unlikely that the subset of orthopaedic specialty in that study would give a DCS rate close to the overall rate. The study by Adewole et al did not include day case orthopaedic surgery rate [10] to which we could compare our result. However, we suspect that orthopaedic DCS rate is low in Nigeria compared to the specialties of paediatric surgery, plastic surgery, and urology.

The substitution indices for removal of plate and screws, removal of intramedullary nail, elongation of tendon Achilles, tendon repair and carpal tunnel release were 4%, 5%, 6.1%, 11.1% and 25%

respectively. These results suggest that we can increase our DCS rate, without necessarily increasing the scope of procedures, by increasing the SI for procedures that we currently perform as day cases. For instance, it should be possible to remove most intramedullary nails in the femur and tibia as day cases using small incisions. Similarly, removal of plates and screws may be performed as day cases except in the hip and femur [11] where significant blood loss may occur with the need for volume replacement. Of the procedures, removal of implants (plate and screws, intramedullary nail) and elongation of tendon Achilles have the potential to increase our DCS rate since relatively more of them were performed as in-patient operations.

The stay-in rate, the complication rate and the absence of mortality, unplanned visit to the hospital and readmission within 30 days after operation suggest that DCS as currently practiced in our centre is safe. This may be explained by the minor or intermediate nature of the procedures done and the choice of ASA I and II patients. The nature of the procedures may also explain why most of them were safely performed by senior residents as reported by others [6, 9]. There were only 2 ASA III patients and both had biopsies in locations that are not associated with severe surgical trauma or significant blood loss. The Royal College of Surgeons of England recommended that ASA III patients may undergo only day case urological procedures [12]. It has, however, been noted that carefully assessed and prepared ASA III patients can undergo day surgery [13]. We believe that ASA III patients should be avoided in places where DCS is still infantile except the procedures are minor or intermediate as in our current practice.

Our stay-in-rate of 3.3% is close to the 2-3% recommended by the Royal College of Surgeons of England in 1992[12] but higher than the current average of 1% [14]. Considering the pervasiveness of poverty in the developing world, part payment may occasionally be accepted from patients based on the promise that full payment would soon be made. This may explain the unacceptable observation of indebtedness as a reason for conversion. Late operation could be avoided by having a theatre suite dedicated to DCS or ensuring that day cases are done before noon. Use of propofol could have prevented drowsiness as a cause of conversion. The reasons for conversion are thus largely avoidable and our stay-in-rate could have been lower. This study found a complication rate of 2.7% which falls within the reported complication rates of 0.9% to 13% [4].

Apart from the teaching hospitals in Ife and Jos which have a dedicated unit [9] and a day case ward [3] respectively, the organization of DCS in Nigeria is hospital-integrated and based on general wards as we currently practice in our centre. A criticism of general ward-based DCS is that emergency admission may block day case admission [15]. We found instances of the converse in this study: 4 patients occupied Accident and Emergency beds in order to have DCS. This undesirable block of emergency beds might have arisen because of pressure to admit the patients due to previous cancellations caused by non-availability of beds.

A limitation of this study is the high number of patients lost to follow up. This means that some complications and unplanned visits to other hospitals could have been missed. Some of these patients would probably have required readmission. The extended family system allows patients from distant areas to stay with their relatives in the city to have their procedures [7]. However, transportation problem might prevent presentation for follow up after their return home. Despite the documentation of GSM phone numbers of 56.4% of the patients, there was no evidence that they were called within the first 24 hours after operation. This might also contribute to missing information on the patients who did not present at all after operation. It is not unlikely, too, that patients felt better and did not come back to hospital.

Another limitation is the retrospective nature of this study. This did not allow us to study operation time as well as rate of and reasons for cancellations. These were not documented for most of the patients. Considering the non-complex nature of the procedures, it is likely that mean operation time was less than one hour. However, cancellation rate was likely to have been high because of the model of DCS organization in our centre.

Conclusion

The utilization of DCS can be improved by performing more of the basket of procedures as day cases rather than in-patients. The scope of procedures should be increased only with better organizational model and improvement in technological and surgical competence. While the ideal is a free-standing DCS unit within the hospital, the present practice can be improved by having a ward and a theatre suite dedicated to DCS. Our current practice appears safe despite the use of general wards and theatre suites shared with in-patient surgery. The block of accident and emergency beds by day cases resulting from our organizational model is undesirable.

Declaration

We hereby declare that the paper titled **Day Case Surgery – Experience in a Nigerian Orthopaedic Hospital**, authored by A. Ajibade, BL Lawson and FB Ayeni has not been published or submitted for consideration for publication elsewhere.

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