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Re-Operations: A Two Year Experience at Gezira National Centre for Pediatric Surgery-Sudan

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Abstract:

Background: The development of pediatric surgical care in Africa has suffered from the neglecance of health policy makers, yet surgery remains an essential component of basic healthcare and an important means of providing preventive and curative treatment. Although the Sudan started with very few specialists who were trained in pediatric surgery to overcome the need of this specialty which started in the late of 70th and early of 1980th with only 5 surgeons. Re-operative surgery in pediatric patients is a challenge that is confronted by every surgeon, a particular operation may be initially done and followed by appropriate post-operative care, functional or anatomical problem may need further surgical intervention.

Objective: To evaluate the magnitude of re-operation in pediatric patients seen at GNCPS.

Methods: This is a retrospective and prospective descriptive hospital based study that was conducted over two years as from March 2014 to Feb2016 at GNCPS. The study includes all pediatric surgical patients who needed a redo surgery.

Result: The number of patients studied were111.The age distribution of studied group, the most common age group was less than 5year(n= 78) patients representing 70.3 %, followed by age group 6-10 year (n=19) 17.1% and the last age group 11-15(n=14) 12.6%. The ratio of male to female is 5.16:1. 61.3 %(n=68) of patients from the rural areas while 38.7% (n=32) from urban areas. The person who did the first operation: 47.7% (n=53) were done by pediatric surgeons, 28.8% (n=32) operated by registrars, 18% (n=20) done by medical officers, 5.4% (n=6) operated by general surgeons. The final outcome of the patients: 49.5% (n=55) of them were alive without complications, 35.1% (n=39) alive with complications, Number of patients who died were 15.3% (n=17).

Conclusion: The majority of redo-operations are done under the age of 5year. Less than 50% of the initial operations were done by specialized pediatric surgeons reflecting the gross shortage of surgeons in this discipline. More than 80% of initial operations were done at specialized centers reflecting the poor set-up at the center. The gastrointestinal (GIT) system was associated with the most surgical redo. The mortality following redo-operations was high.

Key word: Hirschsprung disease, hypospadias and hydrocephalus.

Introduction:

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Re-operative surgery in pediatric patients is a challenge that is confronted by every surgeon, a particular operation may be initially done and followed by appropriate post-operative care, functional or anatomical problem may need further surgical intervention. Bowel resection in a neonate may develop a stricture if the anastomotic site does not grow at the same rate as the adjacent bowel and may need redo. The cancer patient may require re-operation for treatment of recurrences or for the treatment of the complications of chemotherapy. Pediatric patient require lifelong follow up, this increase the chances of requiring reoperation for many surgical condition. Not every pediatric surgical re-operative problem has a wealth of contemporary literature. Re-operative surgery requires seldom used and more complex operative techniques. A close functional relationship between surgeons, pathologist and radiologists allows the surgeon the full advantage of surgical therapies or radiological interventional techniques and therapies, as best suits the individual patient needs. Hirschsprung disease (HD) is the most common cause of neonatal intestinal Obstruction. Reoperations for HD encompass a broad spectrum of surgeries designed to overcome the spectrum of postoperative complications after a pull-through procedure. These include repeated dilatation, myectomy, and repeat pull through procedure. The usual reoperative neurosurgical procedure that the pediatric surgeon encountersis revision of a failed ventricular drainage device, most commonly a ventriculoperitonealshunt (VPS).

Recurrence rates for inguinal hernia repair in infants and children are lower than in adults, and vary from less than 0.5% to approximately 4% [136–1140]. The recurrence rate for inguinal hernia repair may be lower when performed by trained pediatric surgeons compared to adult general surgeons [141].

Material and Methods:

Study design: This is a retrospective and prospective descriptive hospital based study that was conducted over two years as from March 2014to Feb2016 at GNCPS. The study includes all pediatric surgical patients who need a redo surgery.

Data collection: A patient data sheet was constructed to collect data. The source of data was the hospital records in the retrospective group and direct interview and evaluation in the prospective one.

Statistical Analysis

Data was coded and fed in a computer to handle statistical and mathematical procedure, to display the analyzed data and present them graphically using SPSS software.

Result:

The number of patients studied were111. The age distribution of studied group showed that the most common age group was less than 5year (n= 78) patients representing 70.3 %, followed by age group 6-10 year (n=19) 17.1% and the last age group 11-15(n=14) 12.6%.

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The ratio of male to female was 5.16:1, male (n= 93) percentage 83.8%, and female (n= 18) percentage 16.2%.

61.3 %(n=68) of the patients were from the rural areas while 38.7% (n=32) from urban areas.

Table (1and2) show the first diagnosis of the patient related to system involved; GIT system was most commonly involved 50.5% (n=56), the next one was genitourinary (GU) system 29.7% (n=33), the third system was central nervous (CNS) system 15.3% (n=17), the last was others e.g. skin conditions and soft tissue tumors 4.5% (n=5).

The date of initial surgical operation, the most common operations were done in 2014 and 2015, 36.9% and 34.2% respectively, followed by 11.7% 1n 2013.

The place of the first surgical operation was: 83.8% (n=93) operations were done in specialist centers and 10.8% (n=12) were done in regional hospitals, 2.7% (n=3) of operation were done in tertiary hospitals and also 2.7% (n=3) were done in rural hospitals.

Table (3) shows the level of surgeon who did the first operation: 47.7% (n=53) were done by pediatric surgeons, 28.8% (n=32) operated by registrars, 18% (n=20) done by medical officers, 5.4% (n=6) operated by general surgeons.

Table (4and5) show the diagnosis after the initial surgery: GIT problems 50.5% (n=56), GU represents 25.2 %(n=28), CNS 10.8(n=12), others were 13.5 %(n=15).

Table (6) shows the type of redo operations related to systems: gastrointestinal tract was 46.8 %(n=56), Genitourinary was 25.2% (n=28), CNS was 16.2% (n=18), others were 11.7(n=13).

Table (7) shows that most of reoperations were done by pediatric surgeons 67.6% (n=75), followed by registrars 27.9% (n=31), 2.7 (n=3) redo operations were done by medical officers, only 1.8% (n=2) were done by general surgeons.

Patients hospital stay: most of the patients stayed 1-2 weeks 48.6 % (n=54), less than one week were 33.3% (n=37), more than two weeks were 18% (n=20).

Table (8) shows the complications after redo operations: 49.5% (n=55) lived without complications, 10.8% (n=12) complicated by septicaemia, 9.9% (n=11) complicated by infection, followed by stenosis 6.3%,stricture 5.4%, incontinence 4.5%, minigities 3.6%, colostomy prolapse 3.6%, peritonitis 1.8%, recurrent abdominal pain .9%, bed sore .9%, leakage .9% and non-functioning VP shunt .9%.

The final outcome of the patients: 49.5% (n=55) of them are alive without complications, 35.1% (n=39) alive with complications and 15.3% (n=17) of them died.

Table (1): The diagnosis for which first surgery was done:

	Frequency	Percent
HSD	12	10.8
Small bowel atresis	5	4.5
Appendecular abscess	4	3.6
Hypospadias	14	12.6
Bilateral UDT	1	.9
Epispadias	1	.9
Imperforate anus	10	9.0

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Congenital hydrocephalus	17	15.3
Rt. UDT	2	1.8
LT UDT	1	.9
Rt. O.I.H	2	1.8
Lt. PUJ	1	.9
Circumcision	4	3.6
Intussusceptions	5	4.5
Malrotation	4	3.6
Urethral stricture	1	.9
Lt. Leg De gloving injury	1	.9
Blunt abdominal trauma	3	2.7
Stub wound abdomen	1	.9
Vesicle stone	1	.9
Lt nephroplastoma	1	.9
TOF	1	.9
Tie tongue	1	.9
Bilateral renal stone	1	.9
Infantile HPS	1	.9
Anterior displaced anus	1	.9
Axillary swelling	1	.9
Back lipoma	1	.9
Lt OIH	1	.9
Anal stenosis	2	1.8
LT renal stone	1	.9
Perforated appendix	1	.9
Acute appendicitis	3	2.7
Omphalocele major	1	.9
Rt. Scapular mass	1	.9
Infected omentocele	1	.9
Intestinal volvulus	1	.9
Chronic oesteomylities	1	.9
Total	111	100.0

Table (2) :The diagnosis for which first surgery was done by system

	Frequency	Percent
Gastrointestinal	56	50.5
Genitourinary	33	29.7
CNS	17	15.3
Others	5	4.5
Total	111	100.0

Table (3): Level of surgeon who did the first operation

	Frequency	Percent
Pediatric surgeon	53	47.7
General surgeon	6	5.4

Registrar	32	28.8
Medical officer	20	18.0
Total	111	100.0

Table (4): The diagnosis after the initial surgery

	Frequency	Percent
Gastrointestinal	56	50.5
Genitourinary	28	25.2
CNS	12	10.8
Others	15	13.5
Total	111	100.0

Table (5): Show the diagnosis after the initial surgery.

Diagnosis	Frequency
Adhesive intestinal obstruction	6
Peritonitis	5
Interval appendectomy	3
Hypospadus 2and stage	3
Rt intrabdominal testis	1
Sever epispadus	1
Wound dehesance	4
Blocked shunt	11
RT UDT	1
Urethral fistula	9
LT UDT	1
Recurrent rt OIH	2
LT Uretric stricture	1
Anal stenosis	5
Recurrent intussception	1
Recircumcision	4
Uretheral stricture	2
Duodenal atresia	1
Lt nephroplastoma	1
Cystitis	1
Post pullthrough incontinence	4
Anastomatic leak	5
Tie tounge	1
Exposed VP shunt	1
Bilateral renal stone	1
Gastric outlet obstruction	1

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Recurrent axillary lump	1
VP shunt leak	5
Colostomy stenosis	4
Back lipoma	1
Lt OIH	1
Imperforate anus	2
Appendicular abscess	1
HSD	5
Colostomy prolapsed	8
Bowel gangrene	1
Recurrent renal stone	1
Incissional hernia	2
Rt shoulder liomyosarcoma	1
Recurrent omentocele	1
Chronic oestiomylities	1

Table(6): The type of redo operation.

	Frequency	Percent
Gastrointestinal	52	46.8
Genitourinary	28	25.2
CNS	18	16.2
Others	13	11.7
Total	111	100.0

Table (7): The person who did the redo operation.

	Frequency	Percent
Pediatric surgeon	75	67.6
General surgeon	2	1.8
Registrar	31	27.9
Medical officer	3	2.7
Total	111	100.0

Table (8):Complications after redo-operation.

	Frequency	Percent
Recurrent abdominal pain	1	.9
Septicemia	12	10.8
No complications	55	49.5
Stricture	6	5.4
Anal Stenosis	7	6.3

Bed sore	1	.9
Infection	11	9.9
Incontinence	5	4.5
Peritonitis	2	1.8
Meningitis	4	3.6
Colostomy prolapsed	4	3.6
Bowel Leakage	1	.9
Nonfunctioning VP shunt	1	.9
Total	111	100.0

Discussion:

This is a retroprospective hospital based study aiming to reflect the magnitude of redo operations in Gezira national center of pediatric surgery (GNCPS), Wad Medani, Gezira State from March 2014 to Feb 2016. At the end of the study period the data of 111 patients who satisfied the inclusion criteria was analyzed.

There were no previous studies that addressed the issue of reoperations in pediatric patients at GNCPS and in the Sudan. Most of literature studies discussed the redo surgery separately and their complications. There were few data that was applicable for aim of discussion to the results of this thesis.

The study showed that the age of the patients was mostly under the age group 5year (n= 78) patients representing 70.3 %, second age group 6-10 year (n=19) 17.1% and the last age group 11-15(n=14) 12.6%. The burden of pediatric surgical load is the under five population as anomalies are managed around this period. According to the gender males commonly underwent redo operations male to female ratio 5.16:1.The high male ratio in this series can be explained by the presence of penile anomalies, complicated circumcisions, UDT and congenital inguinal hernia. The bulk of the patients were coming from rural areas about 61.3% and the remainder from urban areas representing 38.7%.

In this study the majority of operations that required a redo were initially performed at specialized pediatric surgery centre (83.8%). On the other hand the study found that around 50% of the initial operations were performed by specialized pediatric surgeon the few pediatric surgeons available are often over-worked and are largely inaccessible to the overwhelming majority of the population. This has been attributed to heavy workload, a frustrating lack of facilities, and poor compensation. Under these conditions, it is difficult to attract young surgeons with the promise of a rewarding and satisfying career. [9]

Hirschsprung disease, hypospadias and hydrocephalus were on top of the list of conditions that required a redo in this study. Reoperations for HD encompass a broad spectrum of surgeries designed to overcome the spectrum of postoperative complications after a pull-through procedure. These include repeated dilatation, myectomy, and repeat pull through procedure. It is well known that hypospadias surgery poses a tremendous challenge to pediatric surgeons. With over 300 procedures

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reported in the literature, complications are still frequent and account for a good number of redo surgeries in any pediatric surgery facility.

Shunt failure after primary insertion occurs frequently, with incidence of 40% at 1 year and 50% after 2 years. Shunt complications include infection, migration, and dysfunction caused by obstruction, mechanical failure, or abdominal causes. Operations like circumcisions are frequently performed outside hospital settings and may end in disastrous complications. Although excess foreskin, infection, and sometimes amputation of the glans penis has been reported and may need revision of circumcision or repetion .Major complications from circumcision are very rare and minor complications are estimated to be as low as 0.2% to as high as 6% [147–149,151,152].

In this study complications were observed in nearly 50 % of patients after redosurgery giving rise to high morbidity and prolonged hospital stay. Mortality was documented in 15.3 % of our patients.

Many of pediatric surgery centers in Sudan are overcrowded, poorly funded, and lack facilities such as dedicated pediatric wards, pediatric emergency room, neonatal intensive care unit (NICU), pediatric radiology, and pediatric pathology which are considered basic requirements for a sustainable pediatric surgery practice. Where these facilities exist, they are often poorly equipped and are frequently operated by those who have not undergone dedicated pediatric training.

Poor obstetric services limit the ability to perform prenatal diagnosis and planned delivery for infants with severe congenital anomalies as obtained in most developed countries. Even when referrals to appropriate healthcare facilities are done, the poor condition of rural roads and inadequate transport facilities often lead to neonatal loss in transit or presentation in a debilitated and decompensated physiological state. All these factors contribute to the high morbidity and mortality in this study.

Conclusion:

The majority of redo-operations are done under the age of 5year. Less than 50% of the initial operations were done by specialized pediatric surgeons reflecting the gross shortage of surgeons in this discipline. More than 80% of initial operations were done at specialized centers reflecting the poor setup at the center. The GIT system is associated with the most surgical redo. The mortality following redo-operations is high.

Recommendations:

Despite great advances in pediatric surgical care in Sudan, the number of pediatric surgeons in practice needs to be increased to match the increasing number of children seen with major anomalies.

For good results, we must have a thorough understanding of the spectrum of pediatric pathology and malformations, employ proper evaluation and management, use meticulous techniques, and employ rigorous careful postoperative regimens.

Certain pediatric operation should be done by senior pediatric surgeons (e.g. neonatal surgery, hypospadus and etc) unless to save the patient lives.

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Well-trained young pediatric surgeons should be recruited in specialized centers, so as to improve the outcome for pediatric patients.

Adequate budget should be alloted for pediatric surgery centers to upgrade the infrastructure and recruit trained and dedicated staff.

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