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Schistosomiasis in Inguinal Hernia Sac: Case Report

By Wilson I. B. Onuigbo & Chineme M. Anyaeze

Abstract- Probably on account of easy ambulatory surgery, hernia operations appear to be popular all over the world. Incidentally, a review of it, which was carried out in this center, revealed rare cases. Therefore, the purpose of this paper is to add a case in which schistosomiasis presented itself surprisingly in an inguinal hernia. Thereafter, such cases were discussed at some length.

Keywords: hernia, inguinal, schistosomiasis, rare cases, developing community, epidemiology.

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Schistosomiasis in Inguinal Hernia Sac: Case Report

Wilson I. B. Onuigbo^α & Chineme M. Anyaeze^σ

Abstract- Probably on account of easy ambulatory surgery, hernia operations appear to be popular all over the world. Incidentally, a review of it, which was carried out in this center, revealed rare cases. Therefore, the purpose of this paper is to add a case in which schistosomiasis presented itself surprisingly in an inguinal hernia. Thereafter, such cases were discussed at some length.

Keywords: *hernia, inguinal, schistosomiasis, rare cases, developing community, epidemiology.*

I. INTRODUCTION

Easy ambulatory hernia surgery seems to hold sway all over the world as in Chile (1). In Taiwan (2), such a repair was described as “a common and straight forward surgical procedure.” In our developing community (3), it is so popular that odd presentation concerning lipoma was documented (4). Therefore, the purpose of this paper is to present our experience of the rare association with schistosomiasis. Moreover, it is necessary to review world patterns in terms of the diverse countries affected.

II. CASE REPORT

AN, a 65-year-old man of the Igbo ethnic group presented at the Mater Hospital, Afikpo, with an inguinal swelling of one-year duration. On examination, all systems were essentially normal apart from left-sided gynecomastia. The hernia itself was easily reducible. There was some thickening of it in addition to cream colored hard patches. The submitted cup-shaped mass, which measured 7 cm across, had been removed surgically and safely. Microscopy revealed that the thickening was due to infestation by innumerable ova which were terminally spined characteristically. Therefore, the case was diagnosed as that of *Schistosoma haematobium*.

III. DISCUSSION

Despite the gains in the health care delivery, schistosomiasis has prevailed as a health challenge in the tropics (5). An interesting aspect of it is the publication of hernia case reports such as ours. Among them are those of metastatic pancreatic adenocarcinoma (6), and dirofilariasis (7). Elsewhere,

rectum polyp case was reported on by the authors concerning our community (8).

Moreover, there was need to review single case reports occurring worldwide. They are as follows: transplant liver in Philippine (9), colon in Sudan (10), skin in Brazil (11,12), cerebrum in China (13), lung in Madagascar (14), skin in Nigeria (15), and infertility in UK (16).

Incidentally, one of us dealt with the historical aspect of the hernia (17). The findings included association with hydrocele, confined intestine, colloid cancer, and swallowed data-stones! Indeed, a most revealing review also came from this community (18). In conclusion, therefore, the subject of herniation as well as the diversification of its presentation is of interest worldwide.

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Case Report Blunt Trauma: An Uncommon Cause of Bile Duct Injury

By Dr. Arpit Bandi, Dr. Kulwant Singh, Dr. Aashirwad Datey & Dr. Ravi Pratap Singh

Peoples College of Medical Sciences and Research Centre

Introduction- Disruption of the biliary tree secondary to blunt trauma is a rare cause for extrahepatic bile duct injury [1–4]. It seldom occurs alone, hence, this type of injury is easily overshadowed by more overt surgical emergencies and may go undiagnosed, leading to complications and potentially adverse outcomes in the later course. A variety of imaging modalities have been used to varying degrees of success in identifying biliary tree disruption for stable patients but in emergent settings exploratory laparotomy remains the most efficacious means for identifying injury [4,5,6]. The spectrum of severity ranges from severe ones such as transection or laceration, to contusion and hematoma. The incidence of bile leaks following hepatobiliary trauma ranges from 0.5 to 2.1% depending on the methods used to diagnose the bile leak. We present here a rare case with injury to both IHBR and EHBD as a consequence to abdominal trauma.

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Case Report Blunt Trauma: An Uncommon Cause of Bile Duct Injury

Dr. Arpit Bandi^α, Dr. Kulwant Singh^σ, Dr. Aashirwad Datey^ρ & Dr. Ravi Pratap Singh^ω

I. INTRODUCTION

Disruption of the biliary tree secondary to blunt trauma is a rare cause for extrahepatic bile duct injury [1-4]. It seldom occurs alone, hence, this type of injury is easily overshadowed by more overt surgical emergencies and may go undiagnosed, leading to complications and potentially adverse outcomes in the later course. A variety of imaging modalities have been used to varying degrees of success in identifying biliary tree disruption for stable patients but in emergent settings exploratory laparotomy remains the most efficacious means for identifying injury [4,5,6]. The spectrum of severity ranges from severe ones such as transection or laceration, to contusion and hematoma. The incidence of bile leaks following hepatobiliary trauma ranges from 0.5 to 2.1% depending on the methods used to diagnose the bile leak. We present here a rare case with injury to both IHBR and EHBD as a consequence to abdominal trauma.

II. CASE REPORT

A 25yr old male presented to the emergency at around 3am with an alleged history of road traffic

accident due to motorcycle collision with a heavy vehicle.

On presentation, Patient was hemodynamically stable. On Gross examination, He was conscious and oriented and had no signs of any head injury. He had mild pallor and no icterus or clubbing at the time of admission. He had multiple facial injuries with unstable mandibular arch along with a split maxilla. Also, there were multiple lacerated wounds intra-orally and extra-orally but no gross injury mark over the abdomen or other regions. On per abdomen examination, the abdomen was soft with no visible distension. There was no guarding or rigidity although the patient had mild tenderness in right hypochondrium. Apart from this, the chest and pelvic compression were negative.

USG abdomen suggested a small hypoechoic lesion in left lobe of liver s/o liver contusion. CECT abdomen was done which revealed a Laceration in the segment 4A of liver (around 4.6 * 3.45 cm) around the left portal vein reaching upto the liver capsule with mild-moderate hemoperitoneum.

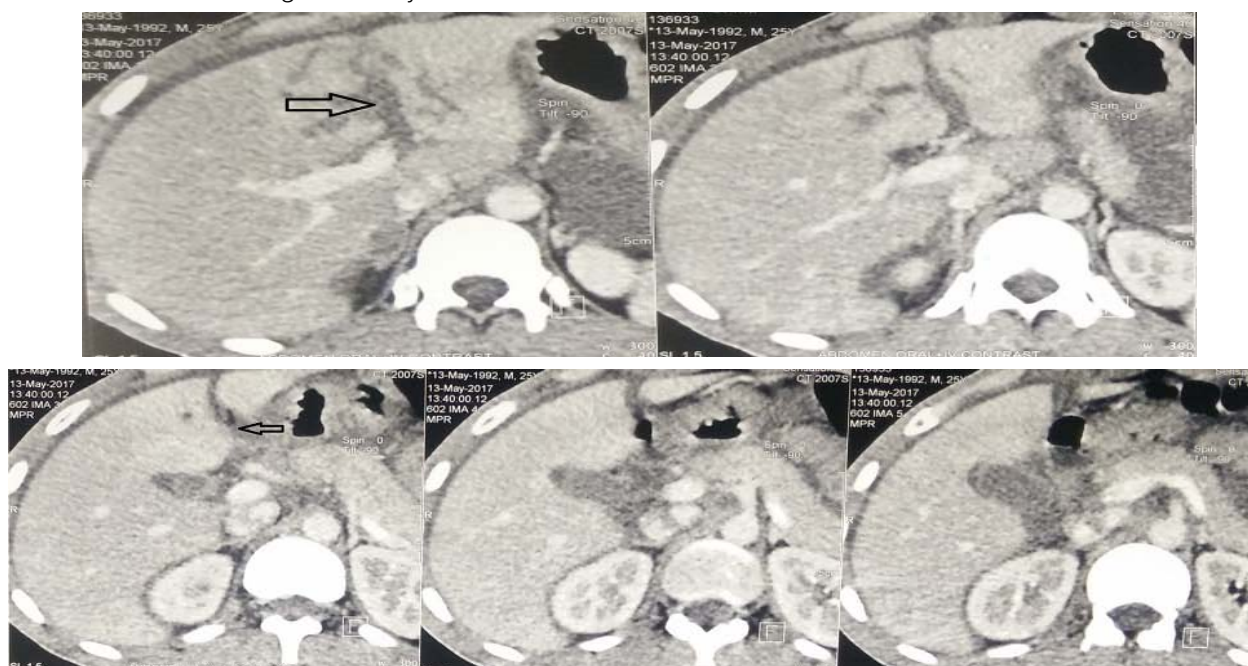


Figure 1: Initial CECT abdomen Showing lacerated 4A segment of liver (black arrow) around the left portal vein

Initial Blood investigations revealed Hemoglobin of 8gm/dl, Bilirubin 0.70 mg/dl, raised SGOT – 180.3 IU/L (range 5-40 IU/L) and SGPT – 189.4 IU/L (range 5-40 IU/L) and reduced Serum proteins (Total - 4.56 gm/dl, range 6.0 – 8.0 gm/dl, Albumin – 2.81 gm/dl, Globulin – 1.75 gm/dl). Patient was transfused 1 unit Packed Red blood cells and 4 units of fresh frozen plasma. The patient remained hemodynamically stable and hence was managed conservatively over the next few days. Jaundice which was absent initially developed over the next 2 days with Sr. bilirubin rising to 3.41mg/dl on post admission Day(PAD)-2, (Direct- 1.76mg/dl and indirect

1.65 mg/dl) and 3.86mg/dl on PAD-4. (Direct- 1.62mg/dl, Indirect – 2.24 mg/dl) while the liver enzymes improved and became normal by PAD-5.

On PAD-10, the patient complained of heaviness of abdomen with distension and on examination the abdomen was tense and tender. On needle aspiration, contents were bile stained and so an abdominal drain was placed under local anesthesia and around 1-1.5 Litres of bile stained fluid was drained. Repeat CECT abdomen was done which revealed partial resolution of the earlier lesion with altered morphology of the associated IHBR and left portal vein.

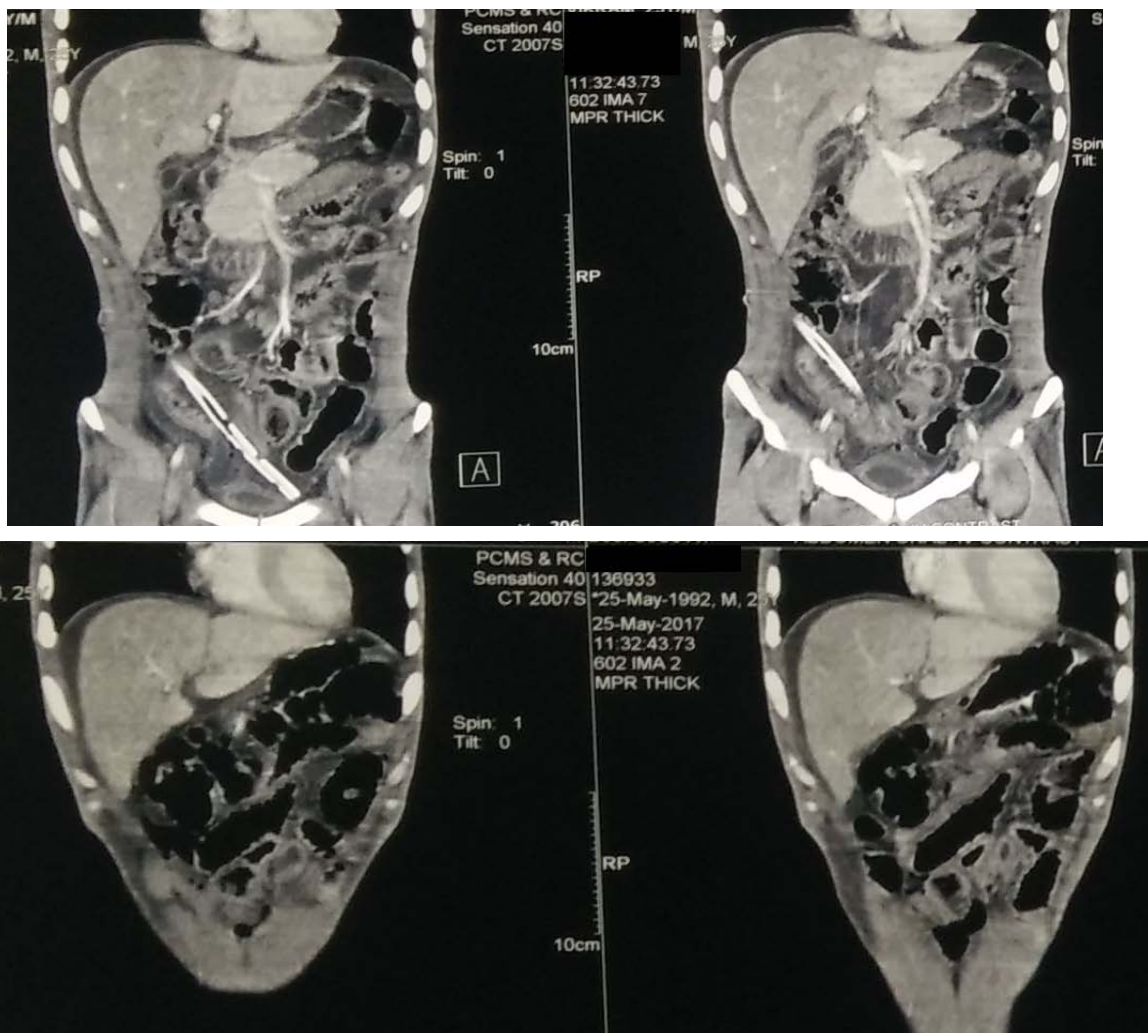


Figure 2: Repeat CECT abdomen showing resolution of the previous lesion with altered morphology of IBHR and Left portal Vein

The first 24-hourly output in the abdominal drain was around 800ml and persisted between 500-1000 ml over the next 4 days and hence the patient was planned for ERCP. ERCP was done which revealed a leak in proximal CBD for which stenting was done with a DPT plastic stent of 7 FR * 10 cm placed across leak. The drain output reduced to less than 100 ml the following day after ERCP and negligible amount thereafter. The following period was un-eventful and the patient was

operated for facial injuries and discharged thereafter. He remains in regular follow-up and has been doing well.



Figure 3: ERCP image showing Leak from the Proximal CBD

III. DISCUSSION

Traumatic injuries of the extrahepatic biliary tract are uncommon, with incidence ranging from 2 to 5 % in abdominal trauma, mainly affecting the gallbladder [2, 3, 5, 10]. Most lesions of extrahepatic bile ducts are caused by penetrating trauma [2, 3, 13] while IBHR injury usually results from blunt trauma with liver involvement.

The exact mechanism of injury to the bile duct after blunt trauma is not well known, but a number of factors are identified as responsible for it: (1) a shear force or stretch or avulsion that intersects the duct at its point of attachment to the pancreas or liver; (2) a short cystic duct, causing rapid emptying of the bladder when force is applied, with a sudden increase in intraductal and subsequent predisposition to injury; (3) a shear force applied to the common duct where it is already strained; (4) a compression of the ductal system against the spinal column [1, 3, 4]. Perhaps a combination of these factors promotes injury of the extrahepatic biliary system. The most frequent sites of injury to the extrahepatic bile ducts in blunt abdominal trauma are at the upper edge of the pancreas, the hepatic duct bifurcation, and in the origin of the left hepatic duct [5,8,9].

The clinical presentation virtually divides patients with injuries in the extrahepatic bile ducts into two groups: one with early diagnosis, where laparotomy is indicated because of the presence of hypovolemic shock and signs of peritoneal irritation or associated injuries. The second group is composed of patients with a delayed diagnosis, which are often presented with nausea, vomiting, jaundice, and abdominal pain with distension, as the case in our patient. [3,4,6]

Ultrasonography and computed tomography can result in false negative. Although US is an operator-dependent exam, abdominal ultrasonography was performed twice by different radiologists in the and no

injury concerning the biliary tract was observed. The computed tomography common findings in bile duct injury are swelling in the hepatoduodenal ligament, free fluid in the peritoneal cavity, and associated injuries to the liver and duodenum.

Earlier reports showed that the optimal time period from injury to repeat imaging studies for high-grade liver injuries ranges from 7 to 10 days; the mean time for complications to surface. Most bile leaks are diagnosed when a CT scan shows a collection or intra-abdominal fluid [14]. Although, the presence of free fluid is sensitive, it is non-specific for bile leak. In a recent study of liver lacerated patients, CT scanning showed 98% hemoperitoneum but only 25% had bile leak [15].

If there is no indication for early surgical treatment, the diagnosis of injuries to the extrahepatic bile duct may be delayed, as what had happened in the case [3–5]. Patients not operated on, early in time, and with a biliary fistula may remain asymptomatic for days, because the bile is a sterile component and can be well tolerated. Patients may present few symptoms including abdominal discomfort, nausea, vomiting, jaundice, ascites, and fever [7,10]. The presence of jaundice after blunt abdominal trauma is suggestive of a missed bile duct injury, but other common diagnoses should be also considered such as massive blood transfusion, liver disease, hepatic trauma, hematoma absorption, or cholecystitis.

Endoscopic retrograde cholangiopancreatography (ERCP) can diagnose and eventually treat bile duct injury with stent even if surgical procedures have been conducted before [7,11].

The surgical treatment of injuries to the bile ducts should be individualized, based upon hemodynamic stability, associated injuries, and upon the location and extent of the injury. Complications such as biliary fistulae, abscess, and stenosis may be reduced with early diagnosis and appropriate management during surgery. The high morbidity and mortality of these patients are related to associated injuries and their complications.

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Keywords: end stage heart failure, ventricular assist devices, heart transplant.

GJMR-I Classification: NLMC Code: WG 169



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I. INTRODUCTION

In the last two decades, several studies have described higher rates of operative mortality with selected surgical procedures at low-volume hospitals suggesting an inverse correlation between number of high-risk surgical procedures and mortality (1-3). The main reason claimed for explaining this inverse correlation is the lack of experience of the surgical team and, more in general, of the low-volume healthcare providers in handling complex surgical procedures associated with complex and potentially fatal complications. Although hospital volume of a few high-risk cancer procedures (e.g. pancreatectomy and esophagectomy) is a strong predictor of operative risk, relationship between volume and outcome are considerably weaker for cardiac surgical procedures, such as CABGs (4). More specifically, LaPar et al. clearly demonstrated that hospital procedure volume is not associated with in-hospital mortality for the performance of CABGs and they did not find a threshold value for hospital procedure volume at which mortality risk was significantly increased. Patient

mortality risk was primarily attributable to patient-level risk factors (5).

Is it the same for patients requiring long term mechanical circulatory support (MCS)? The first study to investigate the use of long term MCS was the landmark REMATCH trial that demonstrated superior survival and quality of life in patients supported with LVAD when compared with those treated medically (52% versus 23% 1-year survival) (6). Since then, the number of hospitals accredited to perform MCS proliferated rapidly even in non-heart transplant centers. In the first 3 years after LVAD therapy approval, in the USA, the majority (53%) of 377 destination therapy (DT) recipients underwent device placement at centers that performed less than 4 DT implants (7). Lietz et al. investigated the effect of centre volume on outcomes after VAD implantation and categorized centers as small if they had implanted less than 50 devices as bridge to transplant or less than 4 as DT per year (7).

Rose et al. showed that centre experience with DT seemed to significantly correlate with the 1-year survival, but the DT centre volume was not an independent predictor of 1-year survival with DT when adjusted for the preoperative DT Risk Score, suggesting that other factors, such as improved candidate selection, may play a role in improving long term results (6). Further, a systematic review examining the influence of surgery volume on patient outcome determined that individual surgeon volume had greater effect on outcomes than institutional procedural volume (8). Therefore, the statement that institutional volume accurately represents medical expertise does not always correspond to reality.

The objective of this study is to review the outcomes of patients who were enrolled in our long term MCS program, to assess if the LVAD can be safely implanted in a low-volume, heart transplant centre.

II. METHODS

Definition of low-volume centre: centre implanting less than 50 devices as bridge to transplant or less than 4 as DT per year (7). Study design. This is a single centre, retrospective cohort study, examining clinical outcomes of consecutive patients in end stage Heart Failure who received a long-term VAD from

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November 2007 to March 2017, either as bridge to transplant or as DT. All patients underwent heart transplant eligibility work-up and were enrolled in the heart transplant and DT program running in our institution. CHUV is a University Teaching Hospital where approximately 600 cardiac procedures with extracorporeal circulation are performed annually. From 2007 to 2011, VAD therapy was handled mainly by the general cardiac surgeon and the cardiologist. From 2013 to 2017, patients were systematically discussed in structured heart team meetings including also anaesthesiologists, intensive care therapists, and perfusionist all specifically trained in MCS. The role of VADs coordinators was also created. During the weekly meeting, patients in end stage heart failure were presented by the cardiologist or by the intensive care specialist and the different therapeutic options were discussed and analysed according to the most updated literature. For each patient the team defined a clear strategy of treatment including the level of therapeutic commitment in dealing with complex problems and the role of each specialists in the different phases of the therapeutic project (pre-operative, operative, post-operative and long term). Roles and competences of each member of the team are illustrated in figure 1.

Data collection. Baseline clinical characteristics, pre-implant clinical course and outcomes were obtained from the medical records. The primary outcome was survival to transplant or ongoing MCS at 1 year. Secondary endpoints were frequency of major adverse cardiovascular events (MACE) as defined by Kip (9). Statistical analysis. Normally distributed continuous variables were reported as mean $\pm$ SD and compared using the Student t test. Survival analysis was performed using Kaplan-Meier method with censoring for cardiac transplantation. A p value <0.05 was considered statistically significant.

III. RESULTS

During the 10-years study period, 50 adult patients received MCS (table 1); 35 male (70%), mean age 49 $\pm$ 8 years. All patients exhibited NYHA IV heart failure symptoms. Causes of heart failure included ischemic cardiomyopathy (n=26), acute myocardial infarction (n=10), idiopathic (n=10) and others (n=4). VAD was implanted as BTT in 48 and DT in 2. The devices implanted were: HeartMate II in 18 (36%), HeartWare in 20 (40%), HeartMate III in 12 (24%). Five patients (10%) required temporary right ventricular support with CentriMag pump (St. Jude Medical, St. Paul, MN, USA) due to failure to wean from CPB. After device implantation, antiplatelet therapy was initiated with acetylsalicylic acid and after drains removal, anticoagulation was achieved with intravenous heparin followed by transition to anti-vitamin K. From 2013 on, the Heart Failure Team handled the MCS program.

Outcomes were: death in 16 (32%), 10 where in-hospital, heart transplant in 24 (48%), uneventful ongoing support 10 (20%) (figure 2). The mean waiting time under MCS before transplantation was 316 $\pm$ 61 days. Data were analysed according to the management team (pre and post heart team era) and 2 groups of 25 patients were identified: 2007-2013 (mean INTERMACS level 3.1) and 2014-2017 (mean INT. level 3.9) showing survival at 1 year of 56% and 80% respectively (figure 3). According to the type of device implanted, 3 groups of patients were identified: HMII = 18 (mean INT. level 2.7), HW=20 (mean INT. level 3.3) and HMIII=12 (mean INT. level 3.6), showing survival at 1 year of 52%, 78% and 91% respectively (figure 4). MACE are illustrated in table 2.

IV. DISCUSSION

The need for MCS in patients waiting for heart transplant is dramatically increasing in Switzerland (10). In the last 10 years, the number of patients waiting for heart transplant has increased of 120% while the number of transplanted patients remains stable (in 2016, 41 received and organ and 150 were on the waiting list). We conducted this study to assess if LVAD can be safely implanted in a low-volume, heart transplant centre. At the beginning of our experience, the surgeon was the "lone star" providing VAD therapy in extremely ill heart failure patients. Patient was referred to surgeon either when in cardiogenic shock or when deteriorating on inotropes (INTERMACS profile 1 and 2). VAD implant was considered as the last "life-saving" treatment and, in such condition, the discussion on patient selection was unrealistic. Moreover, anaesthesiologists and intensive care specialists were not specifically trained to managing chronic heart failure patients with VADs. As expected, clinical results were poor encouraging cardiologists to refer patient until all other options have been exhausted. Late referrals, when patients are too sick to tolerate the LVAD surgery, further perpetuate the vicious cycle of serious operative complications, poor outcomes, and the reluctance to extend such treatment to healthier populations. The survival rate in the pre heart team era was below 60% at 1 year. We therefore decided to build a heart team dedicated to heart failure involving also specialists in other domains than cardiac surgery and cardiology with specific training in heart failure patients. This was independent from the number of patients treated per year that remained constantly below 20. It is well known that multidisciplinary and structured team work enhances the quality of care and we believe this is even more important for the management of patients requiring VAD therapy giving the complexity of the technology employed, the critically ill population and the intensive long-term postoperative medical therapy required. Chowdhury and coll., have shown that surgeon specialty training and the contribution of specialty trained members of a

multidisciplinary team responsible for patient care are independently associated with improved patient outcomes (8). Our team included also anaesthesiologists, intensive care specialists, specialised nurses, perfusionists and VAD coordinators (figure 1). Each team member received specific training in VAD therapy in high-volume centers and attending dedicated workshops and courses endorsed by the EACTS, wet-labs and meetings. They also participate to continuous medical educational program in mechanical circulatory support provided by national and international medical associations or supported by industry. The first positive effect of the heart team approach was on patient selection. The traditional resistance to referring patients with ESHF earlier in the disease course was mitigated by directly involving the heart failure specialist cardiologists into the MCS program. Since then, the number of “crash and burn” patients reduced dramatically (from 10 to 5) and the mean INTERMACS level of the patients treated from 2014 to 2017 was higher than that of the previous group (figure 3). The surgical procedure didn't change significantly except for the number of temporary mechanical support implanted to assist the right heart. The other aspect concerns medical management in the immediate post operative phase. Intensive care specialists and cardiologists shared the experience they acquired in high volume centres on haemodynamic optimisation, including fluid and inotrope therapy, VAD settings and support of right ventricular function. Echocardiography has become an essential tool in optimising haemodynamic, identifying complications and predicting right ventricular failure (11) and all treatment adjustments are done under echocardiographic control.

The introduction of the VAD coordinator played also a key role in improving long term results that largely pertain to prevention and treatment of infectious complications, the main cause of death with DT (12). Two studies comparing early- to late-enrolment REMATCH trial (12, 13) and outcomes at the 4 largest volume U.S. centers pointed to infection as the single complication, the rates of which significantly decreased as centre experience increased. The 1-year and 2-year prevalence rates of DL infection were 9% and 19% (14). Our driveline infection rate, was significantly higher than that reported in literature, but the clinical impact was limited to daily wound care for all patients except one who required cable transposition.

The one-year survival rate of patients treated using the multidisciplinary approach was non-inferior to the best clinical results reported in literature (15).

The MOMENTUM 3 trial has recently shown that the fully magnetically levitated centrifugal pump HeartMate 3 has a higher rate of survival free of stroke or reoperation to replace the pump at 6 months after implantation than was implantation of the mechanical-bearing axial continuous flow pump HeartMate II among

patients with advanced heart failure, irrespective of their eligibility for transplantation (16). These results are consistent with the results of another centrifugal LVAD, the Heartware HVAD. In a recent report, Schmitto and al. shown excellent outcomes for patients on the device with a survival rate of almost 60% at 5 years (17). We therefore believe that the improvement in our long term-results is also due to the technical performances of new generation magnetically levitated pumps (figure 4).

Our study has several limitations. As all low-volume centres, methodology lacks of solid scientific approach given the retrospective study design and the small sample size which limit the possibility to compare outcomes among patient subgroups. Therefore, these results may not be generalizable to other centres. It is not possible to deeply analyse statistical differences between sub-groups and clearly identify the determinants of the outcomes.

In conclusion, in this manuscript we share our experience stressing the importance of team work even if this is not supported by statistical analysis. We believe that the institutional expertise in VAD therapy have a significant impact on outcomes of this therapy, but at least in our hands, is not correlate to caseload. Long term MCS can be implanted at low-volume centres with survival rate not inferior to most recent clinical trials. Although we were not able to elucidate which aspects of centre experience were the most critical, better selection of candidates, systemic approach to surgical and postoperative care, as well as the long-term medical management, may have all contributed to the improved outcomes. Availability of a trained Heart Team with expertise in long-term MCS treatment facilitate appropriate patient selection and results improvement over time. A Heart team specifically trained in heart failure is probably more important than institutional volume in determining outcomes after VAD implantation.

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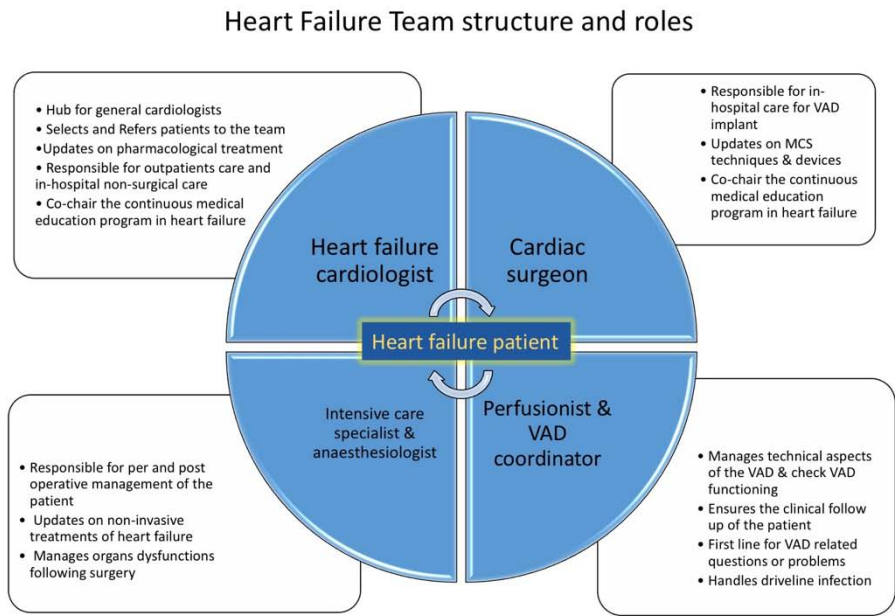


Figure 1: Organisation and key roles of the members of the heart failure team

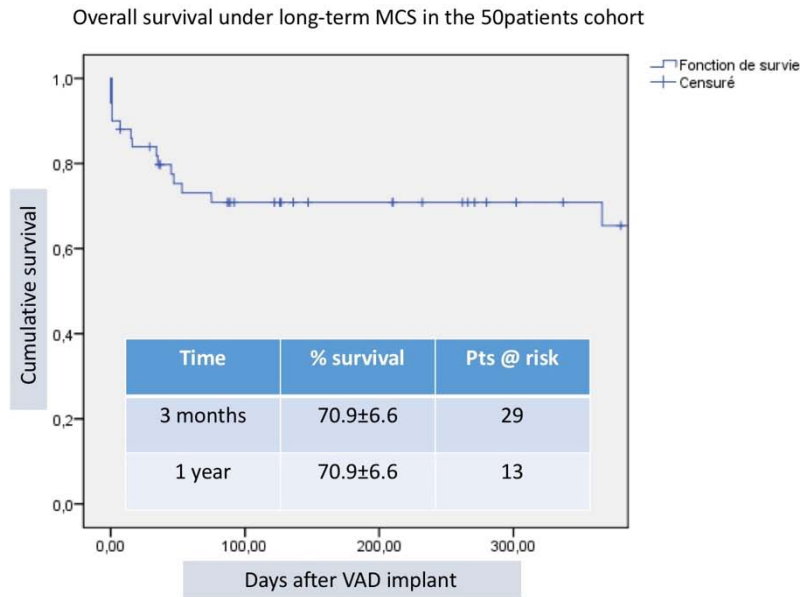


Figure 2: Cumulative survival of patient under VAD according to implant date

Survival under MCS according to management strategy

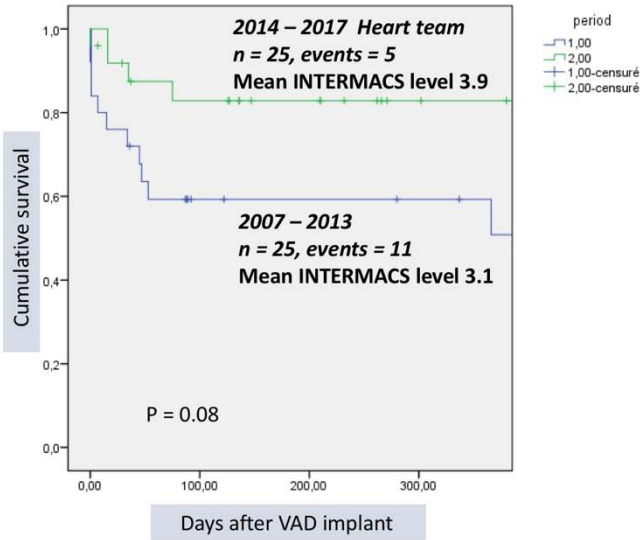


Figure 3: Cumulative survival of the 2 cohort of patients managed with and without team approach

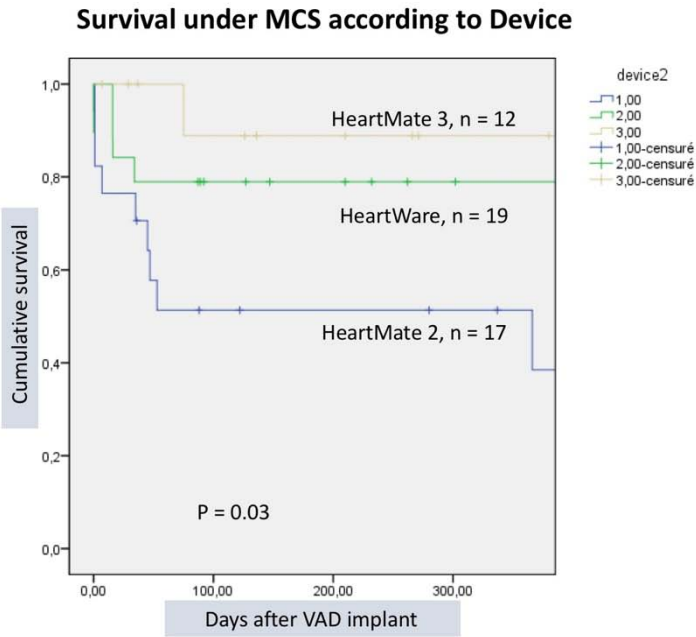


Figure 4: Survival rate according to device implanted. There is no statistical difference in survival rate between HM3 and Heart Ware

Table 1: Preoperative clinical information of the patients that underwent VAD implant

Preoperative clinical information for patients who received VAD therapy	
VAD patients (n = 50)	
Male	35 (70%)
Mean age	49 ± 8
Heart Failure aetiology	
Ischemic cardiomyopathy	26 (52%)
Non ischemic cardiomyopathy	4 (8%)
Acute myocardial infarction	10 (20%)
Idiopathic	10 (20%)
Intention of therapy	
BTT	48 (96%)
DT	2 (4%)
Hospital length of stay (days)	32 (21 to 224)
NYHA class IV	31 (66%)
INTERMACS level	3.2
Cardiac arrest	8 (16%)
Other organ failure	
Renal	13 (26%)
COPD	2 (4%)

BTT, bridge to transplant; DT destination therapy; INTERMACS, Interagency Registry for Mechanical Assisted Circulatory Support; COPD, Chronic Obstructive Pulmonary Disease

Table 2: Major adverse cardiac events 30 days after VAD implant. Raw data are presented

Major adverse cardiac events in the 50 patients cohort

Adverse events	Total number (50) n - %	2007-2013 (25) n - %	2014-2017 (25) n - %
Right ventricular failure requiring mechanical support	17 (34%)	11 (44%)	6 (24%)
Pulmonary embolism	4 (8%)	3 (12%)	1 (4%)
Bleeding requiring surgery	19 (38%)	11 (44%)	8 (32%)
Stroke			
Ischemic	2 (4%)	1 (4%)	1 (4%)
hemorrhagic	1 (2%)	1 (4%)	0
Driveline infection			
Conservative treatment	22 (44%)	12 (48%)	10 (40%)
DL Transposition	1 (2%)	0	1
Pump thrombosis	1 (2%)	1 (4%)	0

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Laparoscopic Appendectomy Versus Open Appendectomy in Pediatric Patients

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Abstract- Objective: The aim of the present study was to assess the advantages of laparoscopic appendectomy (LA) compared with open appendectomy (OA) in children, regarding outcomes, operative time, length of hospital stay, antibiotic use, and available variables.

Background: Appendicitis is a common cause of acute abdominal pain in children. Surgical removal of the appendix by either OA or LA is the treatment of choice. Over last two decades, LA has failed to be considered superior over OA in adults and children.

Methods: A retrospective chart review of 1883 pediatric patients (≤ 14 years) diagnosed with acute appendicitis that underwent LA or OA at King Abdulaziz Medical City, Riyadh,

Results: A total of 1883 pediatric patients underwent appendectomy (65% male, mean age ten years old). OA surgical approach was performed in 1673 (88.8%) patients with a mean age of 10 ± 2.4 . LA was performed in 210 (11.2%) with a mean age of 10.28 ± 2.5 .

GJMR-I Classification: NLMC Code: WI 535



LAPAROSCOPIC APPENDECTOMY VERSUS OPEN APPENDECTOMY IN PEDIATRIC PATIENTS

Strictly as per the compliance and regulations of:



Laparoscopic Appendectomy Versus Open Appendectomy in Pediatric Patients

Abdullah Khubrani^α, Rana Al zahrani^σ, Abdulhafidh Kadhi^ρ, Mohammed Al Namshan^ω
& Saud Al jadaan[✧]

Abstract- Objective: The aim of the present study was to assess the advantages of laparoscopic appendectomy (LA) compared with open appendectomy (OA) in children, regarding outcomes, operative time, length of hospital stay, antibiotic use, and available variables.

Background: Appendicitis is a common cause of acute abdominal pain in children. Surgical removal of the appendix by either OA or LA is the treatment of choice. Over last two decades, LA has failed to be considered superior over OA in adults and children.

Methods: A retrospective chart review of 1883 pediatric patients (≤ 14 years) diagnosed with acute appendicitis that underwent LA or OA at King Abdulaziz Medical City, Riyadh, Saudi Arabia, between 1998-2014.

Results: A total of 1883 pediatric patients underwent appendectomy (65% male, mean age ten years old). OA surgical approach was performed in 1673 (88.8%) patients with a mean age of 10 ± 2.4 . LA was performed in 210 (11.2%) with a mean age of 10.28 ± 2.5 . The rates of complication were 3.2% and 5.7% for OA and LA, respectively, with no statistically significant difference (p -value = 0.057). The length of hospital stay was significantly different between OA (3.19 ± 2.3 days) and LA (3.81 ± 2.4 days) (p -value < 0.001). The LA approach has a significantly longer operative time of 73.2 ± 25.3 min compared with the OA approach (53.1 ± 24 min) (p -value < 0.001). The LA approach has significantly increased over the study time from 0% use in 1998 to 42% use in 2014.

Conclusions: The LA and OA approach used in the pediatric population show similar risk for post-appendectomy complications. LA is associated with longer operative time, which might contribute to the higher cost. LA has the same need for antibiotics as OA. Our findings show that LA is not superior to OA in children, although further studies including randomized controlled trials and meta-analysis are required.

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I. INTRODUCTION

Appendicitis is a common cause of acute abdominal pain in children. Surgical removal of the appendix by laparoscopic appendectomy (LA) or open appendectomy (OA) approaches is the standard treatment in acute appendicitis (AA). Surgical intervention has a lower rate of post-appendectomy complications than that seen with antibiotic therapy alone (1). LA has shown advantages over OA in many aspects, such as shorter hospital stay, decreased recovery time with a faster return to normal daily activities, less postoperative pain, shorter postoperative ileus, better cosmetic results, lower time for wound healing, and less wound infection (2-8). However, other studies have shown that LA is associated with longer operative time, increased incidence of an intra-abdominal abscess, and higher cost (7-9). Also, a previous study showed that LA has a shorter operative time in complicated appendicitis (10). One trend analysis demonstrated that LA showed a higher risk for complication compared with OA in uncomplicated appendicitis (11). In contrast, other studies have reported that OA has a shorter hospital stay and lower cost (12,13). LA is not the standard approach to AA management in children (11). This subject remains debatable, especially in pediatric patients in which there is a lack of published studies. The aim of the present study was to assess the advantages of LA compared with OA in children, regarding outcomes, operative time, length of hospital stay, antibiotic use, and other available variables.

II. METHODS

a) Study design and setting

The present study was a retrospective chart review conducted at King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia.

b) Identification of study participants

A total of 1883 pediatric patients (≤ 14 years old) who were diagnosed with acute appendicitis and underwent LA or OA between January 1, 1998, and December 31, 2014, at KAMC were included in the study. Pediatric patients undergoing interval or incidental appendectomy were excluded from the study.

Also, six patients with incomplete data were excluded from the study.

c) Data collection process

Ethical approval for the present study was obtained from the Ethics Review Board of King Abdullah International Medical Research Center (KAIMRC) with research approval No. RC14/078/R. Data were collected by the First (AK), Second (RA), and Third (AKA) co-authors. The patients were categorized into two groups, including LA and OA. Demographic, laboratory, preoperative, intraoperative, and postoperative appendectomy data were extracted during a review of the medical files.

d) Data Analysis

Excel was used for data entry. SPSS version 24 software (IBM Corp., Armonk, New York, USA) was used for data management and analysis. Descriptive statistics were used to describe demographic variables. The chi-square test was used to assess the relationship between each surgical approach and categorical variables by percentages and frequencies (e.g., surgical approach and gender). T-tests were used to assess the difference between the type of surgery and quantitative values by measuring the mean and standard deviation (e.g., surgical approach and age). A p-value of <0.05 was considered statistically significant.

III. RESULTS

A total of 1883 pediatric patients (mean age of 10 years old) that underwent appendectomy were included in the present study. Males accounted for 64.9% of the patients (male: female ratio was 2:1). OA surgical approach was performed in 1673 (88.8%) patients with a mean age of 10 ± 2.4 . LA was performed in 210 (11.2%) with a mean age of 10.28 ± 2.5 . Conversion of LA to OA was needed for one patient and was included in OA numbers. Additional variables were compared between the two approaches, including gender, WBC count, neutrophil percentage, imaging, operative surgeons, histopathology reports, and rate of complication (Table 1). A statistically significant difference was seen between LA and OA neutrophil percentages, operative surgeons, and histopathology reports (p-value = 0.003, <0.001 and <0.001 , respectively) (Table 1). The rates of complication were 3.2% for OA and 5.7% for LA, with no statistically significant difference observed between the two surgical approaches (p-value = 0.057). The length of hospital stay was significantly longer for LA (3.81 ± 2.4 days) compared with OA (3.19 ± 2.3 days) (p-value <0.001 ; Table 2). However, there were no statistically significant differences between the two groups regarding antibiotic consumption during admission (p-value = 0.077). LA demonstrated a significantly longer operative time (73.2 ± 25.3 min) compared with OA (53.1 ± 24 min) (p-value

<0.001 ; Table 2). A significantly higher percentage (30%) of patients that underwent LA used antibiotics upon discharge for a longer period (2.43 ± 2.4 days) compared with OA (p-value <0.001 ; Table 2). The LA approach has significantly increased over the study time from 0% use in 1998 to 42% use in 2014 (Figure 1).

IV. DISCUSSION

Since the first use of the laparoscopic appendectomy approach for the management of acute appendicitis by Semm in 1983(14), it has failed to show superiority over the OA approach in adults and children (11,15). In contrast, in acute cholecystitis, the laparoscopic approach has been shown to have well-established superiority over the open approach (16). However, the LA approach is widely preferred by most surgeons and acceptable as the standard of treatment for AA. A technique is preferred over another due to its safety and few complications. In the present study, the overall complication rate was 3.5% and included IAA, wound infection, and bowel obstruction. The complication rate for both LA and OA approaches in children failed to show statistically significant differences, similar to the majority of recent studies (17-19). However, another report claimed that LA showed less complication rate in pediatric appendectomy (20). In the present study, the LA approach did not reduce the need for imaging (abdominal US and CT) for the diagnosis of appendicitis, which is similar to results from another study (17). However, a new trend is to use imaging for the diagnosis of appendicitis to reduce the incidence of a normal appendix (21). Senior surgeons (consultants and associate consultants) prefer the LA approach; instead, junior surgeons (fellows and residents) prefer the OA approach, which might be due to educational reasons. Similar to many previous studies that included meta-analysis, randomized trial, and cohort studies, the LA approach has been shown to have longer operation times (7-9,12). However, a report by Axel Elofsson¹⁸ and his colleagues found no difference between the two techniques (LA and OA) regarding operative time in children. In the present study, approximately half of LA surgeries were performed by junior surgeons, which may contribute to the longer operative times that we observed. The LA technique can have shorter operative times, but this might depend on the surgeon's experience (21).

Interestingly, our study and others found that the histopathology reports showed that non-perforated appendix and normal appendix were statistically significant between the two methods (LA and OA), with no statistical difference observed in perforated appendix cases (18). Upon seeing more normal or healthy appendices during LA, raises the concern that the LA approach may participate in misdiagnosis of AA.

Furthermore, in the present study, the hospital stay was longer after LA in pediatric patients; however, additional pediatric studies have shown that LA resulted in a shorter hospital stay (17,18,20). The overall hospital stay in our study was longer than most previous studies. One of the main goals of LA is to reduce the use of antibiotics in AA patients, however we did not find an advantage regarding this issue. The present study found a low rate of LA for the management of AA; however, this is no longer the case because the medical community is shifting toward minimally invasive techniques and considers the LA approach the standard treatment of AA (see Figure 1).

V. CONCLUSIONS

LA and OA demonstrates similar risk for post-appendectomy complications in the pediatric population. LA is associated with longer operation times, which

might lead to higher cost. Both LA and OA show a similar need for antibiotics post-surgery. LA is not superior to OA in children, although further studies, including a randomized controlled trial and meta-analysis, are required.

VI. LIMITATIONS

Our single-center study was a retrospective chart review that was associated with the limited patient information. The large variation between LA and OA cases might affect the results. However, most of our results were constant with most recent studies.

Conflict of interest

None declared

Acknowledgements

None

Table 1: Comparison of open and laparoscopic appendectomy in all children

	OA	LA	P-value
Age	10 ± 2.4	10.28 ± 2.5	0.173
Gender (male)	1095 (65.5%)	126 (60%)	0.119
WBC counts	16 ± 4.9	15 ± 5.2	0.259
Neutrophil percentage(%)	79.73 ± 10	77.25 ± 13	<0.01
Complication rate	53 (3.2%)	12 (5.7%)	0.057
Surgeons			<0.01
Senior Surgeons (Associate Consultant and Consultant)	318 (19%)	101 (48%)	<0.01
Junior Surgeon (Fellow and Resident)	1355 (81%)	109 (51.9%)	<0.01
Histopathology reports			<0.01
Non-perforated Acute Appendix	1410 (84.3%)	153 (72.9%)	<0.01
Perforated Appendix	133 (7.9%)	24 (11.4%)	0.086
Normal Appendix	130 (7.8%)	33 (15.7%)	<0.01

Table 2: Operative time, length of hospital stay and antibiotics in children undergoing open or laparoscopic appendectomy

	OA	LA	P-value
Operative time (min)	52.1 ± 24	73.2 ± 25.3	<0.01
Length of hospital stay (days)	3.19 ± 2.3	3.81 ± 2.4	<0.01
Duration of antibiotic during admission (days)	2.29 ± 2.1	2.57 ± 2.1	0.077
Antibiotic on discharge	303 (16%)	63 (30%)	<0.01
Duration of antibiotic on discharge (days)	1.87 ± 1.9	2.43 ± 2.4	<0.01

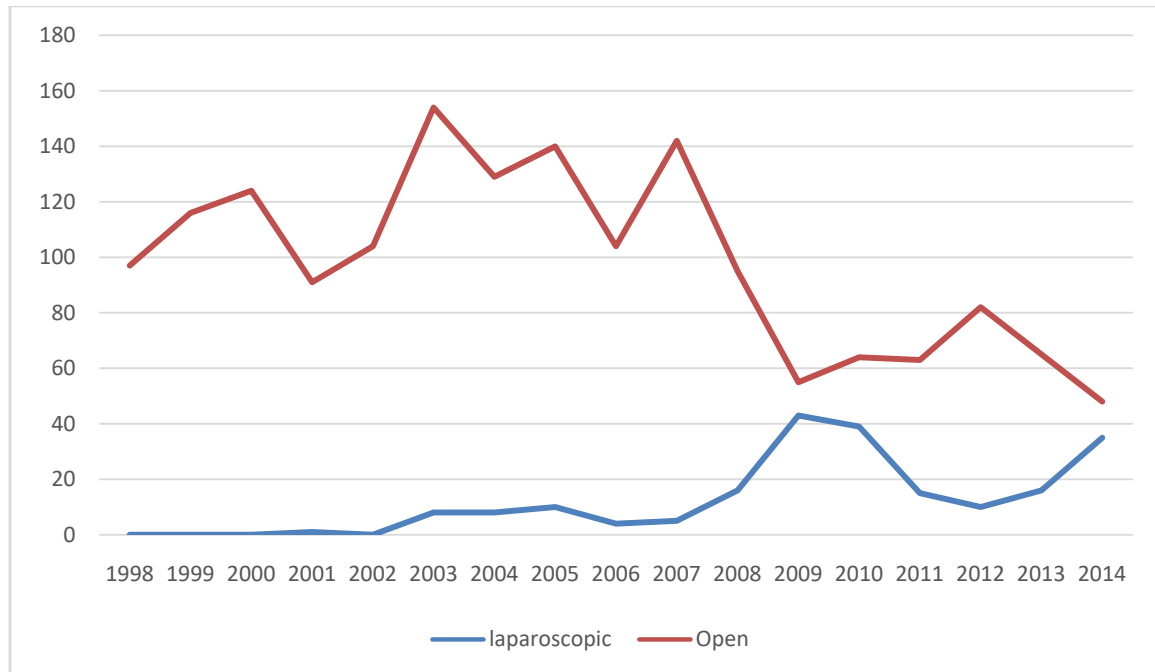


Figure 1: Laparoscopic appendectomy versus open appendectomy cases over time

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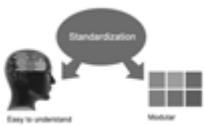
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A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.



Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

PREPARATION OF ELETRONIC FIGURES FOR PUBLICATION

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

TIPS FOR WRITING A GOOD QUALITY MEDICAL RESEARCH PAPER

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.



20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.



The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- o Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- o In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- o Present a background, such as by describing the question that was addressed by creation of an exacting study.
- o Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- o Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- o Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- o Do not include raw data or intermediate calculations in a research manuscript.
- o Do not present similar data more than once.
- o A manuscript should complement any figures or tables, not duplicate information.
- o Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

THE ADMINISTRATION RULES

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.



CRITERION FOR GRADING A RESEARCH PAPER (COMPILATION)
BY GLOBAL JOURNALS

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	C-D	E-F
<i>Abstract</i>	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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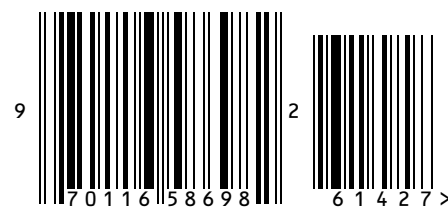
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