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Laparoscopy at Sebokeng Hospital with Emphasis on Trauma

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Received: 9 December 2013 Accepted: 2 January 2014 Published: 15 January 2014

Abstract

Advances in minimal access surgery has revolutionized the practice of surgery over the past two decades. In some areas, laparoscopy has become the standard of care as in cholecystectomy. Laparoscopy in trauma however has been trailing behind, supposedly because of the fear of missing injuries in unpredictable trauma setting. There are reports in the literature about the benefit of laparoscopy in trauma, but we do not have local data in South Africa. We therefore endeavour to assess the place of laparoscopy in trauma by performing this audit of our laparoscopy practice at Sebokeng Hospital, South Africa. Objective: Review of the practice of Laparoscopy at Sebokeng Hospital with special emphasis on trauma to identify the indications of laparoscopy in the management of selected injuries. Methods: Retrospective review of data from all laparoscopic procedures performed between November 2011 and October 2012 at Sebokeng Hospital. Parameters evaluated included demography, mechanism of injury, procedure and intra-operative findings. Result: A total of 390 laparoscopic procedures were performed. Majority were emergency 77.9

Index terms—

1 Introduction

echnology has rapidly revolutionized the practice of medicine in the past two decades. Minimal access surgery is evolving gradually and in some procedures, it has become the standard of care as in laparoscopic cholecystectomy 1,2,3 .

Laparoscopic appendicectomy, the most common emergency general surgical operation has made significant progress over the past few years 4 . But trauma is lagging behind supposedly due to the fear of missing injuries in a somewhat unpredictable trauma scenario 5,12 . While this concern is genuine in a complex case, it should not defer the surgeon from attempting laparoscopy because in selected patients, laparoscopy can reduce the rate of negative and positive but nontherapeutic laparotomies in trauma 6,7 . There is also an added potential benefit of decreasing the incidence of adhesive bowel obstruction and formation of incisional hernia; the most common late complications of laparotomy. Acquisition of skills coupled with sound clinical judgment are paramount for laparoscopy in trauma to gain ground in common surgical practice 5 . The feared complication of missed bowel injury may render the laparoscopic approach counter-productive considering its associated high morbidity and even mortality. Therefore a systematic standardized approach is needed during laparoscopy to lessen the risk of missing bowel injury and a low threshold for conversion should be encouraged in the setting where laparoscopic visualization is challenging or sub-optimal 12 . We do not have published data about our local experience of the use of laparoscopy in trauma. This study will endeavour to give an overview of our laparoscopic practice at Sebokeng hospital with emphasis on trauma. Sebokeng hospital is a regional hospital in South Africa with registrar training program. We believe it is crucial to familiarize the prospective surgeons with laparoscopic exposure in all fields of surgery to keep up with the advancing technology. This entails adjustment in the mind-set and procurement of the necessary skills to adapt to the changes of practice and to overcome the learning curve.

2 II.

3 Objective

Review of the practice of Laparoscopy at Sebokeng Hospital with special emphasis on trauma to identify the indications of laparoscopy in the management of selected injuries.

4 III.

5 Methods

at Sebokeng Hospital, a regional hospital with a Registrar training program. A subgroup of trauma patients treated with laparoscopy was analysed. Parameters included are demography, mechanism of injury, procedure (laparoscopic or laparoscopy-assisted procedures, converted cases) and intra-operative findings. Unstable penetrating trauma were excluded, IV.

6 Statistics

This is a descriptive study using mean, proportion by ratio or percentage.
V.

7 Results

a) Stable (most common): 37 cases i.
Penetrating: 34 cases divided as

8 Discussion

The main intention at this stage was not to accomplish a laparoscopic repair of intra-abdominal pathologies but to avoid unnecessary laparotomy (negative exploration or positive but non-therapeutic finding) or to guide a laparoscopy-assisted minimally invasive open repair. The exception was in the cases of an isolated diaphragmatic injury which were repaired laparoscopically.

9 a) Stab

Thoracoabdominal: herniation, thoracoscopy or laparoscopy is the preferred procedure to perform to rule out diaphragmatic injuries. None of the investigations (Ct scan, ultrasound, contrast study) are sensitive enough to pick up diaphragmatic injury nor specific enough to rule it out 8,9 . In our practise, missed diaphragmatic hernias present later with complications thereof, often with dire consequences. Four of the seven patients with thoracoabdominal stab had diaphragmatic injury that were repaired laparoscopi cally.

Twenty one laparotomies were prevented because of exploratory laparoscopy. In these patients with penetrating stab wounds to the abdomen; the Of the 42 trauma cases, 2 were excluded due to missing data and 40 cases were available for analysis. The mean age was 31.6 years (14-62) and there were 36 males and 4 females with male to female ratio of 9:1. Indications for laparoscopy were divided as follow: clinical pictures were not clear cut early on; usually there is tenderness around the stab with no obvious peritonitis. The main aim of ultrasound and Ct-scan in trauma is to diagnose the presence of intraperitoneal fluid; their roles become even less defined when we consider hollow viscus perforation for which the sensitive and specific is not adequate enough to diagnose or exclude a minor bowel injury 9,10 .

Practising selective conservatism may be dangerous for a nick in the bowel may manifest as peritonitis after 48 to 72 hours (mucous plug preventing early spillage of bowel content). Some surgeons advocate wound exploration under local anaesthesia 11 . If the wound is penetrating then laparotomy is performed (fig. **??**). With this approach, all our patients would have had unnecessary laparotomy. One patient had a self-inflicted stab in the left upper quadrant with impacted knife; the laparoscopic exploration revealed through and through left liver lobe laceration with no other injury (fig. **??**). Under vision the knife was removed and there was no evidence of significant bleeding. A drain was left in situ. If a laparotomy was performed instead, it would have been positive and nontherapeutic.

Six cases were converted, when laparoscopic exploration was positive and the magnitude of injury precluded a safe laparoscopic repair, then conversion was preferable to minimize the chance of missing an injury or performing inadequate laparoscopy repair because advanced laparoscopy skills is required to perform intracorporeal suturing. An example of such case was a patient with right flank stab, the clinical picture was not remarkable and the reason for exploration was to rule out a possible retroperitoneal injury (colon, ureter). When the laparoscopic exploration was almost completed as a nontherapeutic procedure; there was a sudden massive bleed. The conversion revealed a transected left common iliac vein that was ligated. Likewise, 6 patients had an isolated bowel injury on laparoscopic exploration necessitating a minilaparotomy to exteriorise the injured bowel and to perform a safe open repair. With advanced skill in laparoscopy all these cases could possibly have benefited from laparoscopic repair.

10 b) Gunshot

Most gunshots will still qualify for exploratory laparotomy but in certain cases such as stable patients without evidence of peritonitis where intra-abdominal injury is unlikely, laparoscopy can help decide whether there is an injury which does not require further management. We had one such case of a gunshot wound to the right upper quadrant who was shot from behind with the bullet palpable under the skin anteriorly. Exploratory laparoscopy showed a liver injury through segment 8 with minimal oozing and no evidence of bowel injury (fig. **??**). A drain was inserted and the patient was discharged on day 2 uneventfully (positive finding but non-therapeutic). In the second case, there were two gunshot wounds (right upper quadrant and right flank) and on laparoscopic exploration, a transverse colon injury was detected and the laparoscopic approach was abandoned. At laparotomy an additional injury was found in the ascending colon; a right hemicolectomy was performed.

11 c) Blunt injury (acute presentation)

In exceptional cases of polytrauma (blunt abdominal trauma, fracture pelvis and long bone, severe head injury) (fig. 4, 5, 6) with hemodynamic instability, laparoscopy was quickly done to ascertain whether the abdomen was the cause of instability (in which case immediate conversion would have been done) obviating the need for laparotomy and redirecting the focus elsewhere (pelvic or long bone fractures and setting, there is no time to wait for a radiologist to perform a sonar (FAST) or abdominal Ct-scan, the patients were rushed to operating room with the intention to perform a quick diagnostic laparoscopy to rule out the abdomen as the cause of instability. In all three cases, laparotomy was averted because laparoscopy revealed only very minimal blood in the peritoneal cavity (non-therapeutic). Two patients survived and were transferred to Orthopaedic department after initial ICU care. The third one demised due to severity of head injury and associated pelvic and multiple long bones fracture. Of the two survivors, one of the patients had a diagnostic laparoscopy combined with the insertion of an external fixator (C CLAMP) to stabilise the pelvic bone.

12 d) Blunt (delayed presentation)

We had two cases of acute abdomen following assaults. In the first case, we discovered bowel content but the source could not be assessed properly because of the inflammatory response and conversion was necessitated. The second patient showed evidence of pancreatitis (saponification) with no other obvious injury. The procedure was terminated and Ct-scan showed double fracture of the pancreas (fig. **??**). The patient was referred to hepatobiliary unit where laparotomy was performed for definitive management. In this case the laparoscopy obviated the need for two laparotomies. It is important to understand that exploratory laparoscopy can miss retroperitoneal injury, so the mechanism of injury combined with clinical picture should not be overlooked.

From this study, 65% of unnecessary laparotomy were avoided, 15% of patients benefited from mini-laparotomy because of laparoscopic guidance, 17.5% of patients had appropriate decisions made during laparoscopy to proceed to immediate laparotomy (conversion) and in 2.5% the decision was made to abandon the procedure and to prompt special This preliminary study shows that in carefully selected cases, there is a room for laparoscopic exploration; it is not expected to handle complex trauma cases but to identify scenarios where a less aggressive approach can be applied. We did not have any missed injury in this study; not because the surgeons involved had the best laparoscopic technique; but because appropriate decision making was performed i.e. to continue laparoscopically, to change the approach to laparoscopy-assisted mini-laparotomy or to convert to open procedure altogether. By so doing, we understood the best indication of each approach in a given situation. There are cases which were immediately selected for laparotomy that are not part of this study.

We did not perform the breakdown of the 461 cases of laparotomy which were mainly due to trauma but suffice to say that in term of proportion, the 42 cases of trauma laparoscopy represented an estimated 10 -15 % of all trauma laparotomies. This emphasizes the low threshold we had to perform laparotomy rather than laparoscopy at this early phase of laparoscopy in trauma.

13 e) Laparoscopy skill

The skill of the laparoscopic surgeon is paramount to perform a safe laparoscopic procedure. The ability to perform intracorporeal knot tying is essential for an advanced laparoscopy. In our study, some of the converted cases (either to full laparotomy or minilaparotomy) were simple bowel injuries that could have benefited from laparoscopic repair if the surgeon could perform intracorporeal knots. We believe that as our proficiency in laparoscopy improves, more cases will qualify for this approach in future. This will be achievable if the trainees (registrars) are exposed early and consistently to laparoscopy both for emergency and elective cases during their training.

14 f) Instability

Unstable penetrating trauma patients were excluded according to the exclusion criteria and patients in this category had exploratory laparotomies performed. All our laparoscopy for penetrating stabs were stable. We did not expect to perform laparoscopy on a critically ill patient. Neverthless, in a small group (3 cases) of unstable blunt trauma, we performed laparoscopic exploration with the intention to rule out the abdominal cavity as the

cause of instability rather than to perform any laparoscopic repair. This was proven to be beneficial in our setting where access to ultrasound and Ct scans are limited.

15 VIII.

16 Conclusion

Laparoscopy is applicable in various fields of general surgery. Certainly, there is a role for laparoscopy in carefully selected trauma cases. Laparoscopy has contributed to the prevention of unnecessary laparotomy in two-thirds of our cases and in the remaining cases it guided the management towards a minimally invasive surgery (mini-laparotomy) and prompted special investigation that assisted in the decision making. Only 17.5% required conversion. Indeed there is a role for laparoscopy in trauma mainly at this early stage to reduce preventable laparotomy rather than to embark in the repair of complex injuries.

17 IX.

18 Recommendation

We believe this pilot study will provide the general and trauma surgeon with some evidence to consider laparoscopy in very carefully selected trauma settings rather than to have a nihilistic approach.

19 Mechanism

Injury Action

Figure 1:

123467 

Figure 2: Figure 1 :Figure 2 :Figure 3 :Figure 4 :Figure 6 :Figure 7 :

Year
2014

A total of 851 abdominal surgeries were performed (436 emergencies and 415 electives) both for trauma and non-trauma. 54.1% (461/851) of procedures were laparotomies and 45.8% (390/851) of the procedures were performed laparoscopically. Of the laparoscopic cases 77.9% (304/390) were emergencies and 22.0% (86/390) were elective. The elective group was mainly cholecystectomy 74.4% (64/86) while hernias (inguinal, incisional) represented the remaining 25.5% (22/86). Appendicectomy topped the list in the emergency group: 54.9% (167/304). Exploratory laparoscopy contributed 26.3% (80/304) for various pathologies (bowel obstruction, pelvic inflammatory disease, abdominal tuberculosis, pancreatitis) and 13.8% (42/304) were due to trauma. Repair of perforated peptic ulcer occurred in 4.9% (15/304). Of note, appendicectomy and cholecystecto my covered 59.2% (231/390) of all laparoscopies.

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Figure 3:

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