

Minimally Invasive Splenectomy for splenomegaly by traditional technique:A comparative study with conventional laparoscopic Splenectomy

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الخلاصة

الجرادات الغازية الحديثة (Minimally invasive surgery) أسلوب معروف لجميع النظم الصحية، فإنه لا يزال من الممكن القيام بالتقنية الغازية الحد الأدنى من، ناهون بتكثف دلقاتك الياف والأعباء التاء بي تتعلق بالتكثف أو الصدى يفتغيره الممشاكل قد أجريته هذه الدراسات للمقارنة بين الجراحات مع التقنية الكلاسيكية الجراحية التقليدية في جوانب قلة الألم بعد العملية، البقاء لفترة أقصر في المستشفى وقصر فترة النقاهة. في هذه الدراسة تم استئصال الطحال من خلال فتحة صغيرة، والتي هي على قدم المساواة تقريباً بالإجراءات التقليدية بالمنظار، وبالمقارنة مع عدد متساو من حالات الالتفات في خضعت لاستئصال الطحال من خلال تقنيات التقليدية الكلاسيكية. ونتيجة ذلك زل استئصال الطحال من قبل الأطباء لتجميع بينة متنوعة من حيث الامتداد المية روف جيداً أن تكتسب الشفاء التام أو تتحسن بعد استئصال الطحال. في هذه الدراسة، تمت دراسة 18 حالة وخضعت لعدة من استئصال الطحال من خلال وخزق صغيرة، مع البقية منة استئصال الطحال من خلال الشقوق التقليدية الكلاسيكية. تم تسريع المجموعة الأولى في وقت تمكرو، واحتاجوا إلى الأدوية المخدرة بنسب أقل بكثير وكانت فترة نقاهتهم أقصر.

Abstract

Minimally invasive surgery is a well known advantageous technique to all health systems, it is still possible to do minimal invasive technique, without using expensive equipments and its burden regarding; cost, maintenance and other disadvantages. This study was performed to compare minimally invasive surgery with classical traditional surgical technique in the aspects of reduced post-operative pain, shorter hospital stay and shorter convalescence period. In this study our cases underwent splenectomy through small incisions, which are almost equal to laparoscopic procedures and compared to equal number of cases underwent splenectomy through classical traditional technique. Decisions for splenectomy were made by physicians for a variety of well known disease status

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that complete cure or improvement will be gained by splenectomy. In this study, eighteen cases were studied, from which nine were males (mean age 34.3 ± 20.45) and nine were females (mean age $= 21.6 \pm 15.99$). Nine of them were underwent splenectomy through minimally invasive incisions, the other group splenectomized through classical traditional incisions. The first group was discharged earlier; need much lesser narcotic medication and shorter convalescence period. In summary, compared to conventional classical method approach, Minimally Invasive Splenectomy is significantly facilitates the surgical procedure, reduces the risk and difficulty in the cases of splenomegaly. So this technique is more feasible and more effective than conventional classical method for the removing of the splenomegaly.

Keywords: splenomegaly; laparoscopy; splenectomy; surgical procedures, minimally invasive

Introduction

Minimally invasive surgery describes an area of surgery that crosses all traditional disciplines from ophthalmology to podiatric surgery.

It is not a discipline unto itself but more a philosophy of surgery, a way of thinking.

Minimally invasive surgery is to perform major operations through small incisions, to minimize the trauma of surgical exposure.

There are many advantages of minimally invasive surgery over classical traditional techniques:

Reduced post-operative pain, Shorter hospital stay, Improved cosmetic result, Shorter convalescence, Reduced wound complications, Reduced adhesions, Obvious occupational advantages and Less mental burden. laparoscopic splenectomy (LS) is currently the standard approach to resect the normal-sized spleen(1-5) With the increase of the splenic size, LS becomes more technically challenging although the procedure is still feasible(6-8). Hand-assisted laparoscopic technique allows the surgeon to place

one hand into the abdominal cavity while maintaining the pneumoperitoneum, recovering tactile sense and improving the accuracy of manipulation. Thus this modification facilitates the performance of difficult laparoscopic procedure. This has been verified in various complicated laparoscopic procedures, including colectomies, nephrectomies, hepatectomies and so on (9-12). Based on above experience, hand-assisted laparoscopic splenectomy (HALS) may well suit the removal of splenomegaly (final spleen weight >700 g)(13) In this study, we compare minimally invasive surgery with classical traditional surgical technique in the aspects of reduced post-operative pain, shorter hospital stay and shorter convalescence period.

Materials and methods

Patients

This study has been performed in Shorsh military hospital from 1st of January 2008 to the 1st of January 2010. In this study, eighteen cases were studied, from which nine were males (mean age 34.3 ± 20.45) and nine were females (mean age = 21.6 ± 15.99). Nine of them were underwent splenectomy through minimally invasive incisions, the other group splenectomized through classical traditional incisions. All patients investigated thoroughly, blood prepared, pre-operative vaccinations administered and consent was taken.

Study methods

A retrospective comparison was made on the patients' features, intraoperative details, and postoperative outcomes. The study parameters included age, sex, preoperative platelet (PLT) count, the greatest splenic diameter on radiological examination, preoperative diagnosis, final spleen weight, operation time, intraoperative blood loss, length of hospital stay, conversion rate, intraoperative and postoperative complications.

Surgical procedures

LS procedure After induction of general endotracheal anesthesia, patients were placed in the semidecubitus position with the left side elevated 30°. The surgeon stood on the patients' right side with the camera operator. Intraabdominal access was obtained by an open technique at superior crease of the umbilicus, used for establishing pneumoperitoneum and inserting the 10-mm 30° laparoscope. The 10-mm main operating port was located in the midclavicular line below the level of the inferior pole of the spleen. Other two 5-mm working ports were positioned in the anterior axillary line and below the appendix ensiformis. The sites of the ports were adjusted appropriately according to the patient's figure and the splenic size. The first step was to identify any accessory spleen by a careful intraabdominal exploration. The mobilization of the spleen began from the inferior pole usually. The splenocolic ligament and the splenorenal ligament were dissected firstly. Then, the dissection was extended medially along the splenogastric ligament, and next up to the splenophrenic ligament. Although the majority of the mobilization was done with the ultrasonic harmonic scalpel (Johnson & Johnson, USA), any medium-sized vessels (such as the inferior polar vessels of spleen and the short gastric vessels) were ligated or clipped before dissection. At this time, once the stomach was reflected medially, the hilum was isolated. The splenic vascular pedicel was separated at the upper border of pancreas. The splenic artery and splenic vein were ligated and then sectioned respectively, or dissected together with Endo-GIA (Johnson & Johnson, USA) if the vessels enlarged with diameter of >2 cm. In some massive splenomegaly cases, the splenic artery was ligated firstly before the mobilization to interrupt the blood flow into spleen, so as to decrease the giant size and to create enough operative space. At last, the spleen was placed into a retrieval bag and extracted through the umbilical incision after morcellation. It was optional to place a suction drain in the splenic fossa. In some cases, the operations could not be completed successfully with laparoscopic approach only, due to intact spleen required for pathologic examination or the massive size or dense adhesion. So

the procedure was converted to laparoscopy-assisted splenectomy, with an additional accessory incision about 6-8 cm via left rectus abdominis or below the costal margin. Then the spleen was extracted intactly through the accessory incision.

Statistical analysis:

All data entered to the computer and analyzed by special statistical program (Epinfor) version 4.3, published by C.D.C. Different statistical method were used including (mean,Sd),all significant data was tested by using; Chi-square and P-value less or equal to 0.05 considered statistically significan.

Results

Eighteen cases were studied, from which nine were males (mean age 34.3 ± 20.45) and nine were females (mean age $=21.6\pm 15.99$). Nine of them were underwent splenectomy through minimally invasive incisions, the other group splenectomized through classical traditional incisions as shown in tables 1 and 2.

Table (1): Show the details of first group of patients who splenectomized by minimal invasive technique.

Case number	Age in year/gender	Indication/surgery	splenunculi	other
1	11/ female	Hereditary spherocytosis	+ve	+Family history
2	22/ female	-----	-----	Gall stones
3	30/ female	Hereditary spherocytosis	-----	-----
4	19/male	Hereditary spherocytosis	-----	Gall stones CBD stones
5	30/ female	Hydatid cyst	-----	Hx of DU surgery
6	60/male	Mylofibrosis	-----	-----
7	11/ male	Thalassemia major	+ve	-----
8	10/ female	Hereditary spherocytosis	-----	-----
9	10/female	Immune thrombocytopenic purpura(ITP)	-----	-----

Table (2): Show the details of second group of patients who splenectomized by classical traditional technique.

Case number	Age in year/gender	Indication/surgery	splenunculi	other
1	8/ female	Hereditary spherocytosis	-----	-----
2	18/ female	Thalassemia major	-----	-----
3	40/ male	Thalassemia intermedia	+ve	-----
4	24/female	Hereditary spherocytosis	-----	-----
5	55/ female	Chronic myeloid leukemia	-----	-----
6	60/male	Lymphoma	-----	-----
7	32/ male	Hydatid cyst	-----	-----
8	60/ male	Secondary Polythycemia/Hypersplenism	-----	-----
9	12/male	Hereditary spherocytosis	+ve	-----

The length of the incisions were compared in the two groups and the P-value tested, there was a significant advantage over classical traditional method, which is greatly affecting wound cosmetics as shown in table no.3

Table (3): Comparison between conventional Cases and minimal invasive cases according to the length of incision

Type of surgery / Variable	Conventional	Minimal invasive	P. value
Incision			0.049
4cm		1	
5cm		4	
6cm		3	
7cm		1	
15cm	2		
17cm	1		
18 cm	1		
20 cm	1		
22 cm	1		
25 cm	2		
28 cm	1		
total	9	9	

Note: P value less <0.05 is statistical significant

The *dose of narcotics* were compared in the two groups and the P-value tested, there was a significant advantage over classical traditional method, as shown in table no.4

Table (4): Comparison between conventional cases and minimal invasive cases according to the dose of narcotic analgesics

Type of surgery / Variable	Conventional	Minimal invasive	P. value
narcotic			0.0062
1 dose		6	
2 dose		1	
3 dose		2	
6 dose	5		
9 dose	3		
12 dose	1		
total	9	9	

Note: P value less <0.05 is statistical significant

The duration of hospital stay compared in the two groups and the P-value tested, there was a significant advantage over classical traditional method, as shown in table no.4

Table(5) Comparison between conventional cases and minimal invasive cases according to the duration of hospital stay

Type of surgery / Variable	Conventional	Minimal invasive	P. value
discharge			0.023
2 nd day		7	
3 rd day	1	1	
4 th day	2		
5 th day	3	1	
6 th day	2		
8 th day	1		
total	9	9	

Note: P value less <0.05 is statistical significant

Discussion

Decisions for splenectomy in these cases were made by physicians for a variety of well known disease status that complete cure or improvement will be gained by splenectomy(14,15,16,17, 18),although we were not concerned in the pre-operative work-up for splenectomy, all the patients investigated thoroughly, blood prepared, pre-operative vaccinations administered and consent was taken from all of the patients.

The well known facts in classical conventional method are; prolonged pain, convalescence period and long hospital stay, all these were significantly lesser(P value less <0.05 is statistical significant) in our cases who underwent *Minimal invasive* surgery. The ordinary post-operative follow-up for splenectomized patients, is not concerned here, because there is no any advantage over classical conventional splenectomy,in regard to infection rate, opportunistic post-splenectomy sepsis(OPSI),abnormal blood changes and other post-splenectomy events(21,22,23,24).

The dose of narcotics were significantly lower in minimally invasive group than classical traditional group, because the size of incisions and lower tissue damage directly proportional to narcotic analgesic requirement, which is a well known physiological fact (19, 20). The hospital stay was longer in cases who underwent splenectomy for malignant disease (Lymphoma and Chronic Myeloid Leukemia) in both groups, this is related to the complex situation of the original problem (14,15,16,17) The procedure of *Minimal invasive splenectomy* is as follows, in which the experience of the surgeon will be the last factor in the success of the procedure: On the top of the list is the position of the patient ,in which the head of the bed should be elevated(anti-trendelenburg),a sand bag or bridge under the left hypochondrium, crossing the midline ,turning the patient to the right and counteracting this position by elevation of the legs., A proper anesthesia and full relaxation is the secrete of success in this procedure, Using head light will be very helpful with long narrow Diver's retractors, Experience of the surgeon. The procedure started by retracting the lateral margin of the wound to the left, then trying to bring the

spleen anteromedially by a small swab on a stick, while the assistant push the spleen anteriorly by gentle shakes and pressure from posteriolateral aspect, which greatly helps in the delivery of the spleen anteromedially, this will expose the lienorenal ligament, which can be gently hold by long grasping forceps and cut by Mc-Indo scissors under direct vision. Further stretching can be done by introducing two fingers which make the spleen mobility high, then the bed turned to supine position, which make the spleen to fall into the wound, then the lower pole of the spleen will be hold with a gauze swab and start to deliver the spleen by swinging movement outside the abdominal cavity after turning the bed to the right again. When delivery of the spleen is completed, the rest of the procedure can be finished in an orderly fashion easily. After the splenectomy has been finished, the greater omentum, the stomach, the whole left hemidiaphragm and the splenic bed can be inspected for splenunculi with the assistance of head light and retractors. A drain was left at the splenic bed which was removed on second post-operative day. In conclusion the *minimal invasive* surgery is superior to classical conventional splenectomy through big incisions, regarding the post-operative pain, early recovery and cosmetic aspect as well as it achieves the same goal of classical conventional method. It is quite possible to do it by ordinary instruments without laparoscopic equipments.

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