Laparoscopic hernia repair preference rate among surgeons: after a decade

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Introduction

Although very good long-term results have been published for laparoscopic hernia repair, the use of this technique is still about 10%. We present a questionnaire study to display the preference rate of laparoscopic hernia repair among surgeons in Ankara, Turkey.

Methods

This study was performed among the surgeons and surgical residents. In the single page form, the main question was “If you had an inguinal hernia, how would you prefer to have it repaired? Open or Laparoscopic”. As the control group, the physicians in internal medicine departments were requested to fill the same form.

Results

Totally 250 completed form were collected (144 from surgical departments & 96 from internal medicine clinics). Only 3% of the surgeons perform laparoscopic repair in daily practice. The laparoscopic repair preference rate within surgical respondents was 11.1%. It was 76.9% in internal medicine clinics (p=0.000). The difference between surgeons and surgical residents was not statistically significant: 10.4% vs. 13.3% (p=0.773). 78% of the respondents preferred open repair stated that it was a better known technique. 51% considered the choice of local anesthesia as an advantage.

Comment

In 1994, Atabek et al. [1] carried out the first questionnaire study on this subject. They found that 81% of the respondents preferred a traditional inguinal incision approach over a laparoscopic approach (8%). The first study from our group in 1995 [2] displayed a 9.1% laparoscopic repair preference rate in surgical departments and a 16.0% among physicians (p=0.03). A 14.1% preference rate in surgical departments was obtained in the second questionnaire in the year 2000 [3]. When we compare, all three rates in 1995, 2000, and 2007 are statistically similar (Table 1).

A survey among Canadian surgeons [4] revealed 11% laparoscopic hernia repair rate in daily practice for unilateral inguinal hernia. Laparoscopic repair rates were found to be 34% and 35 % for recurrent and bilateral hernias. A more recent study from Pakistan showed 71.4% of the surgeons did not recommend the laparoscopic approach to inguinal hernia [5].

Table 1. Laparoscopic hernia repair preference rates (LHRPR) in three questionnaire studies.

LHRPR	1995	2000	2007
Surgeons	9.1%	16.0%	11.1%
Phycisians	16.0%	-	76.9%

- No statistical difference between surgeons' rates in three surveys.
- Physicians' rate statistically higher in comparison to surgeons in 1995 (p=0.03).
- Physicians' rate statistically higher in comparison to surgeons in 2007 (p=0.000).
- Physicains' rates in 2007 is statistically higher than Physicains' rates in 2007 (p=0.01)

However, the preference rate for laparoscopic technique for the respondents from internal medicine clinics today is much higher than that obtained in the first study.

Conclusion

Although laparoscopic hernia repair has gained a great acceptance from physicians who are not familiar to operating room, its preference rate within surgeons and surgical residents is still very low.

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The Use of Polypropylene Mesh in Repair of Abdominal Wall Defects in Malnourished Subjects

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Introduction

Incisional hernias and abdominal wall defects consume an important part of healthcare resources. Mesh use is a good solution in these problems and can decrease the recurrence. Nevertheless, it may still be challenging to cope with an incisional hernia in certain cases where wound healing process is affected by some factors like poor nutritional status. Furthermore, it is still not clear whether mesh itself improves or impairs the wound healing. This experimental study searched the safety of mesh use in repair of abdominal wall defects in the setting of malnutrition that impairs wound healing.

Methods

A total of 40 Wistar albino rats were divided into 2 groups:
After weighing the subjects and recording the base weights, rats were divided evenly into 2 main groups according to a 2-week feeding regimen:

- Group 1: Control subjects; normally nourished rats (52 kcal/day ≡ 20gr/day)
- Group 2: Malnutrition model; rats fed with a half diet (26 kcal/day ≡ 10gr/day)

At the end of the 2-week period, all subjects were weighed again. Blood samples were withdrawn from the tail vein for the evaluation of the immune response.
Operative technique: After intraperitoneal injection of ketamine (90 mg/kg) and xylazine (10 mg/kg) for general anesthesia, the ventral abdominal wall was shaved and fully prepped with iodine solution. A 6 cm skin incision was set at the midline. A 2x2cm full segment of the abdominal wall excised. This defect was closed with a 2.5x2.5cm monofilament polypropylene mesh (Herniamesh, Turin, Italy). The mesh was secured with 12 separate 3/0 polypropylene sutures (Prolene, Ethicon, UK). Finally, the skin was approximated with the same suture material. Both groups were randomly divided, in advance, into early (E: 21 day) and late (L: 60 day) subgroups according to sacrification dates.
G1-E : Control group; 3-week
G2-E : Malnutrition group; 3-week
G1-L : Control group; 2-month
G2-L : Malnutrition group; 2-month
A 3.5x3.5 cm segment obtained and sent for tensiometry and histopathology after sacrification.

Results

Weight changes: The mean weights of the subjects in the two groups were similar at the beginning of the study. After the 2-week feeding period, half-caloric diet group showed a statistically significant weight change compared with the control group. The subjects in this group lost 12% weight in average in comparison with their base weights. The mean weight loss reached to 18% at the 3rd week and even to 33% at the 2nd month ($p<0.01$). In contrast, control subjects showed no statistically significant weight changes neither at the 3rd week nor the 2nd month.

Mortality: Totally 6 rats died throughout the study. The G1 had only 1 mortal case on the first postoperative day, whereas 5 rats died in G2 on the days 0 (1 rats), 1 (2 rats), 14 (1 rat), and 36 (1 rat).

Wound complications: At week-3, both G1E and G2E groups had one mesh related infection. At month-2, one incomplete skin wound disruption observed in each group. The results were completely similar.

WBC counts: There was no difference in the mean WBC counts of the groups on the operation day. A marked decrease was observed in G2-E on the sacrification day (3rd week) compared with its mean basal value, while no significant change was observed in G1-E (Table 1). However, there were no differences between the late sacrification subgroups (Table 1).

Table 1. The mean values for WBC counts.

Test Date	WBC counts (x103)			
	G1E	G2E	G1L	G2L
	3rd week	3rd week	2nd month	2nd month
Operation day	10.9	8.9*	10.9	9.9
Sacrification day	8.3§	4.3* §	8.7	8.2

* Significant difference within the same subgroup ($p<0.05$).
§ Significant difference between two subgroups ($p<0.01$).

Tensiometry: The mean tensile strength values of G1 and G2 were similar at 3rd week and 2nd month. Control group displayed a significant improvement through 2nd month ($p=0.02$). The difference in G2 did not reach the level of significance ($p=0.06$) (Table 2).

Table 2. The mean tensile strength values of the groups (N).

	G1E	G2E	G1L	G2L
Tensile strength (N)	6.20*	6.58	8.91*	8.27
(1.95)	(2.35)	(2.14)	(2.01)	

Values in parenthesis display standard deviation.
G1E vs. G2E : $p>0.05$ G1L vs. G2L : $p>0.05$
G1E vs. G1L : $p=0.02$* G2E vs. G2L : $p=0.07$

Histopathological evaluation: The only significant difference between G1 and G2 in histopathological evaluation was vascularization, in favour of G1 (Table 3).

Table 3. The means for histopathological scores.

	G1E	G2E	G1L	G2L
Inflammation	1.89	1.63	2.00	1.5
	(1-4)	(1-3)	(1-3)	(1-2)
Vascularization*	3.33	2.37	3.00	2.19
(3-4)	(2-3)	(2-4)	(2-3)	
Fibroblast	2.89	2.63	2.50	2.00
	(2-4)	(2-4)	(2-3)	(2-2)
Collagen	2.55	2.25	3.00	2.83
	(2-3)	(2-3)	(3-3)	(2-3)
Connective tissue org.	3.00	2.75	3.12	2.50
	(2-4)	(2-4)	(3-4)	(2-3)

Values in parenthesis display minimum and maximum scores.
* G1E vs. G2E : $p<0.01$ * G1L vs. G2L : $p=0.02$

Conclusions

Although malnutrition causes high mortality rate, if the subject with malnutrition can survive the use of polypropylene mesh is safe in the closure of abdominal defects with no increase in infection rate and a satisfactory wound healing. The repair of abdominal defects and incisional hernias in major abdominal trauma or surgery patients seems possible but surely needs clinical researches.

The Doses of Local Anesthetic Agents in Lichtenstein Repair

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Introduction

Lichtenstein repair is the gold standard for inguinal hernia repair. It can be performed with local anesthesia in day case basis.

Modern local anesthesia technique for inguinal hernia repair has been well described with the safety limits of the anesthetic agents (LAAs). However, the doses may alter according to the surgeon or the center.

This study was set to determine the factors affecting the amount of LAAs in Lichtenstein repair.

Methods

100 consecutive male patients underwent an elective unilateral inguinal hernia repair were included in this prospective study. Lidocaine 2% as a fast acting agent, and Bupivacaine %5 as a long acting agent were used in separate syringes for local infiltration. All the patients were given intravenous sedation. Sedation consisted of midazolam 0.070 mg/kg, fentanyl 0.70 μg/kg.

Patients' age, hernia side, coexistent systemic disease, primary or recurrent hernia, direct or indirect hernia, the size of hernia (small or medium / large or massive, duration of the operation, sac content (omentum only or bowel), and body mass index were recorded as the independent parameters.

Total anesthetic agent dose (lidocaine+bupivacaine, *in ml*) and lidocaine and bupivacaine fraction doses were used as the dependents.

Table 1. Univariate analysis results.

	Total Dose *(ml)*	Lidocaine Dose *(ml)*	Bupivacaine Dose *(ml)*
Age			
< 45	22.8	11.5	11.3
≥ 45	20.1	10.3	9.8
p	***0.028***	***0.07***	***0.06***
BMI			
≤ 25	18.8	10.0	8.8
> 25	23.2	11.8	11.5
p	***0.001***	***0.017***	***0.01***
Hernia size			
Small or medium	20.6	10.2	10.4
Large or massive	22.2	12.1	10.1
p	***0.25***	***0.009***	***0.69***
Hernia side			
Right	21.5	11.2	10.3
Left	20.0	9.7	10.2
p	***0.22***	***0.027***	***0.98***
Primary hernia	20.6	10.5	10.1
Recurrent hernia	24.4	12.6	11.9
p	***0.094***	***0.10***	***0.23***
Direct hernia	22.2	11.0	9.8
Indirect hernia	20.3	10.5	11.2
p	***0.14***	***0.43***	***0.10***
Sac content			
Omentum	26.6	14.4	12.2
Intestine	21.5	11.5	10.0
p	***0.093***	***0.17***	***0.21***
Duration			
≤ 60 min	18.1	9.3	8.8
> 60 min	22.8	11.7	11.2
p	***0.00***	***0.00***	***0.01***

Results

Univariate analysis (Table 1): Longer operations required significantly larger amounts of LAA. BMI was the main determinant of the duration. The patients with a BMI equal or less than 25 received a mean total dose of 18,8 ml, while patients with BMI>25 required a mean total dose of 23,2 ml (p=0.001).Though, total dose of LAAs was not affected by the size of hernia, a higher mean dose of Lidocaine was given to the patients with large or massive hernias. A significantly lower mean dose of lidocaine was needed for the left sided hernias.

Multivariate Analysis: The only variable in the equation in logistic regression for total LAA dose was BMI. The single significant variable for Lidocaine dose was BMI too.

Conclusions

BMI directly affect the duration of the operation and the dose of local anesthetic agents required. Young adults may need lower doses. size of inguinal hernia are important factors in determining LAAs doses.