

Pain after inguinal hernia repair

Possible role of bowel preparation

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ABSTRACT

Objective: To evaluate the possible effectiveness of bowel preparation on pain after hernia repair.

Methods: This was a prospective randomized study, performed at King Fahad Hospital, Hofuf, Kingdom of Saudi Arabia between January 2000 and December 2002. The group of patient was randomly divided in 2 groups. Sixty-two patients (Group I) had bowel preparation and 65 patients (Group II) had no bowel preparation. All patients in the Group I received lactulose 2 days before surgery and rectal enema on the day of surgery. Patients were assessed at 8 hours interval in the hospital. They were assessed for the severity of pain during the first micturation and bowel motion.

Result: The pain score in the first 24 hours was significantly lower in the Group I ($p < 0.01$) as well as second 24 hours ($p < 0.001$). The pain in the first micturation ($p < 0.001$) and during the first bowel motion ($p < 0.001$) was less in Group I compared to Group II.

Conclusion: Patients with bowel preparation before hernia repair had significantly less pain postoperatively even in the first micturation as well as the first bowel motion than those without bowel preparation.

Saudi Med J 2007; Vol. 28 (11): 1682-1685

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Received 19th February 2007. Accepted 10th June 2007.

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Inguinal hernia repair is one of the most common elective operation performed worldwide for all age groups.^{1,2} Pain following hernia repair remains an issue despite advances in surgical and anesthetic techniques.³ Moderate to severe pain during activity was reported in 66% of patients on day one post hernia repair.³ Management of postoperative pain remains an important issue for the doctor and the

patient. Urinary retention and constipation remains one of the most common problem post-inguinal herniorrhaphy, but few factors were recognized to contribute to the retention.⁴ Little is known about bowel function after inguinal hernia repair and the effect of pre-operative bowel preparation on pain post hernial repair. The aim of this study was to evaluate the effectiveness of bowel preparation on the management of pain following inguinal hernia repair.

Methods. The study included 127 consecutive male patients, ≥ 18 years of age who had inguinal hernia repair performed at King Fahad Hospital, Hofuf, Saudi Arabia between January 2000 and December 2002. Approval for this study was obtained from the Hospitals Ethics Committee. The patients were randomized in the outpatient's clinic before admission into Group I and Group II and written informed consent was obtained. All patients had primary unilateral inguinal hernias confirmed by physical examination. All repairs were performed under general anesthesia, by the same surgeon. There were 62 patients in Group I and 65 patients in Group II. For Group I lactulose (20 ml, twice daily) was started 2 days before surgery and phosphate enema on the morning of surgery. Group II had no bowel preparation at all. No prophylactic antibiotics were given in both groups. All patients received narcotic analgesic, pethiden 1 mg/kg for the first 24 hours if needed, and 50 mg diclofenac orally was given on regular basis to all patients. Postoperative management consisted of standard nursing care and analgesia according to the protocol. Patients were

assessed for postoperative pain at 8 hours interval in the hospital, at first micturation, at first bowel motion and at discharge, by using one linear visual analogue pain scale score. The primary outcome measure was postoperative pain. Postoperative interview was conducted by a senior male nurse, who was blinded to the selection into Group I or Group II. We recorded the worst pain experienced postoperatively (range, 0-10, 0=no pain, 10=maximum pain).

Statistical analysis. Epi info Version 6.02 (October, 1994) was used for statistical analysis. Chi square (χ^2) and student t-tests were used for the comparison of the 2 groups and the difference was considered significant when $p \leq 0.05$. Also, correlation coefficient was used to find out the relation between variable factors (age and pain).

Results. The mean age ranged between 18-57 years in Group 1, and 20-59 years in Group 2. The mean \pm SD age was 37.414 \pm 13.603 (Group I) and 37.687 \pm 11.090 (Group II) (no statistical difference). **Table 1** shows the age distribution among the studied groups. All patients in both groups were male and had a primary symptomatic inguinal hernia. There was no difference between both groups in regard with hernia type or site (**Table 2**). Nontension mesh repair was carried out in both groups. The mean operative time was 45 minutes in Group I and 43 minutes in Group II. Comparisons between the 2 groups are shown in **Table 2**. **Table 3** shows the postoperative pain score in both groups. The postoperative pain was significantly lower in Group I. Also pain score on first micturation and first bowel motion was significantly lower in Group I. The highest pain scores were recorded on the evening of the day of operation. The total analgesic consumed by Group II was significantly greater than in Group I. Seven patients in Group I and 9 patients in Group II required additional narcotic on the second day after operation. Furthermore, the first bowel motion was

Table 1 - Age distribution among studied groups.

Age groups	Group I (n=62)		Group II (n=65)		Significance test
	n	(%)	n	(%)	
10 years	12	(19)	10	(14)	$\chi^2 = 3.32$ $p > 0.05$ insignificant
20 years	9	(15)	6	(10)	
30 years	15	(24)	17	(26)	
40 years	14	(23)	16	(25)	$t = 0.1129$ $p > 0.05$
50-60 years	12	(19)	16	(25)	
Mean \pm SD	37.414 \pm 13.603		37.687 \pm 11.090		

delayed in Group II as compared to Group I and the difference was statistically significant. The length of hospital stay was not significantly different between the 2 groups. In Group I, there are earlier complications such as urinary retention in 2 patients and scrotal hematoma in 2 patients. In Group II, 4 patients had scrotal hematoma, 2 had urinary retention and one had superficial wound infection. All complications healed spontaneously and the outpatient follow up was satisfactory. **Table 4** shows a negative correlation between age and the pain score in the first and second 24 hours and also with total consumed analgesics. There was a positive correlation between age and pain score in the first micturation, in the first bowel motion and the time of the 1st bowel motion. The correlation was more evident and significant in Group 1.

Discussion. Inguinal herniorrhaphy remains one of the most common elective operations for males of all age group and postoperative pain management remains one of the important issues.⁵ Management of the postoperative pain is an important factor for humanitarian and ethical reasons, and to avoid postoperative complications. There is a hypothesis based on neurological principle (the wind-up phenomenon),⁶ which indicated that the most effective way to eliminate or reduce postoperative pain is to prevent the development of pain rather than simply to treat it.⁷ But pain remains a problem despite the pre-emptive use of opioids, non-steroidal anti-inflammatory drugs, and local anesthesia. Our study has shown that preoperative

Table 2 - Comparison between the 2 groups.

Variables	Group I (n=62) n (%)	Group II (n=65) n (%)	Significance test
<i>Nyhus classification</i>			
Type I	18 (29.0)	21 (32.0)	$\chi^2 = 0.021$ $p > 0.05$
Type II	23 (37.0)	24 (37.0)	
Type III	21 (34.0)	20 (31.0)	
<i>Site</i>			
Right	38 (62.0)	40 (61.0)	$\chi^2 = 0.028$ $p > 0.05$
Left	24 (38.0)	25 (39.0)	
Mean duration of procedure \pm SD (Minutes)	45 \pm 3.3	43 \pm 3.2	$t = 0.118$ $p > 0.05$
<i>Postoperative complication</i>			
Hematoma	2 (3.2)	4 (6.1)	$\chi^2 = 1.998$ $p > 0.05$
Retention	2 (3.2)	2 (3.0)	
Infection	0	1 (1.5)	
Hospital stay (days) mean	1.2 \pm 0.6	1.3 \pm 0.5	$t = 1.156$ $p > 0.05$
Weight (kg) Mean \pm SD	81.6 \pm 13.9	79.2 \pm 13.1	$t = 0.484$ $p > 0.05$

Table 3 - Postoperative pain score in the studied groups.

Postoperative conditions	Group I (n=62)	Group II (n=65)	t-test	P-value
	Mean ± SD	Mean ± SD		
Pain score in first 24 hours	4.014 ± 1.456	4.939 ± 0.745	3.005	<0.01
Pain score in second 24 hours	4.110 ± 1.142	5.357 ± 0.875	4.615	<0.001
Pain score in first micturation	4.097 ± 1.038	6.314 ± 1.199	7.476	<0.001
Pain score during first bowel	4.238 ± 1.091	7.454 ± 1.272	10.255	<0.001
Total analgesics	4.793 ± 1.264	6.036 ± 1.036	4.0509	<0.001
First time of bowel motion (hours)	24.621 ± 6.207	50.286 ± 10.63	11.178	<0.001

Table 4 - Correlation coefficient in the studied groups.

Postoperative Conditions	Group I (n=62)		Group II (n=65)	
	r	P-value	r	P-value
Pain score in the first 24 hours	-0.57*	<0.01	-0.4*	<0.05
Pain score in second 24 hours	-0.65*	<0.01	-0.25*	>0.05
Pain score in first micturation	+0.73†	<0.01	+0.26†	>0.05
Pain score during the first bowel	+0.75†	<0.01	+0.31†	>0.05
Total analgesics	-0.37*	<0.05	+0.20†	>0.05
First time of bowel motion	+0.51†	<0.01	+0.22†	>0.05

r - correlation coefficient, *inverted relation between age and pain, †parallel relation between age and pain.

bowel preparation for 2 days was associated with less pain. The Group I were more comfortable in the first 24 hours when their mean pain score was 4.014 compared with 4.939 in Group II ($p < 0.01$). A higher pain score was noticed in young patients who also had more function-related pain.³ The use of parenteral narcotics and oral non-narcotic was significantly greater in Group II. A statistically significant negative correlation was found for age, mobility and the pain score, which have the same opinion with the findings of others.⁴ The use of pre-operative bowel preparation with mechanical cleansing to reduce fecal mass is desirable for elective colon and rectal surgery;^{8,9} application of the same principle may decrease the pressure and compression in the inguinal hernia repair area. The pain was found to be confined locally in the operation field after inguinal hernia repair;⁶ we postulate that the decrease in pressure and compression from the loaded colon to the inguinal hernia repair area might be appropriate to control such pain. This study reveals that patients who had bowel preparation had significantly less postoperative pain in the first micturation and first bowel motion than in patients without preparation. The interesting point is that the positive correlation between ages, pain score at first micturation, first bowel motion and the time for the

first bowel motion. The benefits of bowel preparation lasted considerably beyond the first 24 hours and went on to early bowel motion. All of our patients were operated under general anesthesia, non-tension mesh repair was carried out by the same surgeon, thus eliminating these factors is a confounding variable. In other studies,¹⁰ postoperative complications include scrotal hematoma, urinary retention, and wound infection. It occurred more in the pre-operatively unprepared group. The only drawback of this study is the non-blinding of the surgeon to the randomized patients. This does not however inject any bias into the outcome of the study as the standards of surgery were maintained for all patients.

We have demonstrated a significant reduction of postoperative pain after inguinal hernia repair. It is hoped that this study will stimulate other surgeons to investigate the benefit of preoperative bowel preparation in patients scheduled for herniorrhaphy.

Acknowledgment. *This paper was presented in the 8th Overseas Meeting of the Royal College of Surgeon in Ireland, on 13th-19th March 2003 United Arab Emirates. Thanks and appreciation to Dr. Adel Al-Webdy, Assistant Professor of Community Medicine, for his great statistical work. Thanks and appreciation to Nazmy Al-Sharidy, (Senior male nurse) for his participation in this study.*

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