

AMBULATORY INGUINAL HERNIA REPAIR

By

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In today's financial climate, ambulatory treatments that offer rapid return to full activity, perhaps using local anesthesia, are preferred to more complex procedures as long as they are shown to be effective in managing the disease. This prospective trial is done to evaluate outcome in 112 consented male patients underwent 116 elective open primary inguinal hernia repair on day-case basis. The operation is conducted under local anesthesia given by the surgeon. The inguinal canal floor is reinforced by a tension-free polypropylene mesh. A single dose of prophylactic antibiotic (1 gm of cefoperazone sodium) was given IV before induction of anesthesia for every patient. Patients are discharged home the same day. Follow-up at 1 week, 1 month and 6 months is achieved. No reported mortality. The recurrence rate is nil. No prosthesis required removal or persistent sinus developed during the follow-up period. The overall sepsis rate (all superficial) is 2.58%. There is no urinary, pulmonary, cardiac or CNS complications. Of the 112 patients 21.4% required no pain killers after the first night and about 80% required no further analgesia after the first week. The median time off work is 9 days for office workers and 17 days for manual workers. Inguinal hernioplasty using "onlay sutured tension-free polypropylene mesh under local anesthesia is: simple, safe, substantial cost savings, gives better control of postoperative pain, early return to work, very low rate of recurrence, very low rate of complications and should be emphasized for ambulatory hernia repair.

Keywords: Local anesthesia; Inguinal hernia; Short-stay; Recurrence rates; outpatient surgery; Day case surgery; Postoperative pain.

INTRODUCTION

Repair of the inguinal hernia is the most common operation performed by general surgeon. About 80,000 inguinal hernia repairs are carried out annually in the United Kingdom, of which 10% are for recurrent hernia (1). Ambulatory out-patient surgi-centers are now including hernia repair in their armamentarium. Change in environmental milieu must not compromise the quality of surgery and care of the patient (2).

As postoperative pain is one of the main barriers for increasing the range of ambulatory procedures, its control is of prime importance (3).

Local anesthesia administered before incision produces long postoperative analgesia because local infiltration

inhibits build-up of local nociceptive molecules leading to better pain control in the postoperative period (4).

Amid et al, (5) reported that the preferred choice of anesthesia for all reducible adult inguinal hernia repair is local. It is safe, simple, effective and economical.

There are many different operations for the repair of inguinal hernia., each with its own followers. More recently the use of tension-free polypropylene mesh has become popular, largely because of excellent results reported by Lichtenstein et al. The recurrence rate with this procedure is reported as nil in Lichtenstein personal series (2,6,7).

This prospective trial is done to evaluate the outcome in 112 consented male patients underwent elective, open primary inguinal hernia repair using polypropylene mesh under local anesthesia as regard method's safety, technical

ease, postoperative pain, postoperative complications, return to normal activities and early recurrence.

PATIENTS AND METHODS

Patients selection ⁽²⁾.

The inclusion criteria are: all men with a primary inguinal hernia, resident in Cairo, willing to participate, support available at home for postoperative care, ASA I or II on a preoperative assessment and a telephone available to the patient at home to call for medical assistance, if necessary.

The exclusion criteria are: morbid obesity, complicated inguinal hernia, history of allergy to local anesthetics, children below the age of 14 years and patient's aversion to local anesthesia and day-case surgery.

This trial is conducted at teaching hospitals and Mansheiyet El-Bakry General Hospital in Cairo, between March 2001 and August 2001, on 112 male patients presented with 116 inguinal hernias.

A standard file for every patient. In a preadmission clinic, complete history, physical examination and investigations are performed.

Patient's fitness is graded using American Association of Anesthesiologists Assessment (ASA). Those in grade I or II are fit for ambulatory surgery. The procedure is explained, in details, to the patient and excellent doctor-patient rapport is created. Informed written consent is obtained. Patients are instructed to take nothing by mouth after the midnight before the day of planned surgery. Patients are admitted on the day of planned surgery. All patients received 5 mg midazolam I.M 30 minutes before surgery. On operating table, fixation of IV canula, and single dose of IV prophylactic antibiotic (1 gm of cefoperzone sodium) is given before starting of anesthesia and IV fluids are begun by slow drip and continued until the surgery is completed, to which 5-20 mg medazolam is added depending upon the age and weight of the patient. During operation EKG, oxygen saturation, blood pressure and pulse are monitored automatically and respiration is documented by supervising nurse.

Local Anesthetic Administration.

This is done by the surgeon after preparation of the operation site as usual. We use "the wound infiltration technique" first described by Amid et al ⁽⁵⁾. We use 3:2 mixture of 1% Lidocaine and 0.5% bupivacaine with 1/250000 epinephrine. The maximum safe dose of both with epinephrine are 7 mg / kg ⁽⁶⁾ and 3mg / kg respectively. ⁽⁹⁾

About 5 ml of the mixture is infiltrated "Subdermally" along the premarked line of incision (Fig. 1). Without extracting the needle completely the "intra-dermal infiltration and making skin wheal" (Fig. 2) is achieved along the same line using about 3 ml of the mixture. Then about 10 ml of the mixture is injected deep in the "Subcutaneous tissue" by "vertical insertions" of the needle 2 cm. Apart. (Fig. 3) Injections are continued as the needle is kept moving to reduce the risk of intravascular infusion "Subaponeurotic injection", about 10 ml is injected underneath external oblique aponeurosis through a window created in the subcutaneous tissue at the lateral corner of the incision (Fig 4). Infiltration of few milliliters of the mixture at the level of pubic tubercle, around the neck and inside the indirect hernia sac is required to achieve complete local anesthesia. (Fig. 5)

At the end of the operation "splashing" of about 10 ml of the mixture into the inguinal canal before closure of the external oblique and into the subcutaneous space before skin closure. It is essential that the surgeon maintain frequent communication with the patient during administration of local anesthesia and at various intervals during the operation.

Operative Technique

A standard procedure using Lichtenstein principles, details of which have been fully documented. ^(2:67-11). The inguinal canal is opened with ample separation of the external oblique muscle from the rectus sheath. Delivery of the cord including the ilioinguinal nerve, external spermatic vessels and the genital nerve is done and the hernia identified. In case of indirect sac, dissection and complete freeing it to a point beyond its neck.(Fig 6). It is opened and explored, then high ligation and excision is done. In the event of direct sac, if large, the sac is inverted and bulging posterior wall flattened with absorbable suture. The repair is done using "Onlay Sutured tension Free monofilament polypropylene mesh covering the entire posterior wall of the inguinal canal and overlapping conjoint tendon and rectus sheath by 1 : 1.5 cm. The medial end is sutured with oo proline to the anterior rectus sheath above the pubic bone. The periosteum of the bone is avoided. This suture is continued (as a continuous suture with not more than 3 or 4 passes) to attach the lower edge the mesh to the inguinal ligament to a point just lateral to the internal ring.

A new internal ring is fashioned by splitting the lateral portion of the mesh creating two tails which surround the cord to create a snug unyielding opening. The upper edge of the mesh is sutured in place with two interrupted absorbable sutures, one to the rectus sheath and the other to the internal oblique aponeurosis (Fig. 7). The external oblique and subcutaneous tissues are closed in routine fashion using absorbable sutures.

Postoperative Care

The patient is allowed to walk off the operating table assisted by a nurse to the recovery room. After taking some drinks and emptying his bladder, he is discharged home accompanied by responsible adult. A written set of instructions (Table 1) is given to the patient. Every patient is instructed to report on every point in the instruction sheet at one week, at one month and at 6 months. In case of delay, the patient is telephoned to bring the report.

Table (1): Postoperative Instruction Sheet.

- Surgeon's name: Mobile number: 1 week
- Dates of contact 1 month
 6 months
- Temp. elevation up to 38° C may persist for a day or so. This is normal.
- There may be hardness, sensation of a rope beneath the incision, swelling and bruise marks about the genitals. This will all disappear.
- Take prescribed pills for pain and sleep, only if needed.

- Report on pain severity (non, mild, moderate or severe) during rest and mobilization.
- Report on taking pills for pain.
- Your physical activity is in no way restricted.
- Report on time of return to work.

Please keep in contact and be cooperative with your surgeon

RESULTS

In this prospective trial, 112 patients were underwent 116 elective open primary inguinal hernia repair using tension-free mesh under local anesthesia. The success rate of local anesthesia was 100%. Of 112 patients, 105 (93.75%) reported that they felt relaxed during the operation and satisfied after operation. Only 7 patients (6.26%) reported that they experienced mild discomfort during the operation (manipulation of the sac). They were managed simply by increasing the rate of IV drip containing medazolam and assurance. An average dose of 40 ml of the anesthetic mixture was sufficient for unilateral hernia repair.

Of all, 4 patients (3.6%) had bilateral inguinal hernia, in 3 of them the repair was done in both sides in the same sitting and in one at another sitting according to the patient's desire. Operative findings (Table 2).

Table (2): Operative Findings in correlation with age in decades

Age in Decades	No. of Cases	Type of Hernia				Total
		Indirect	Direct	Dual	Bilateral	
10 : 19	3	3	-	-	-	3
20 : 29	19	18	1	-	-	19
30 : 39	28	21	4	3	-	28
40 : 49	28	13	10	4	1	28
50 : 59	24	8	11	3	2	24
60 : 69	10	4	5	-	1	10
Total	112	67	31	10	4	112

Table (3): Postoperative complications

	Postoperative Complications		No	%
	Deep	Localised		
Infection	[Superficial	[Localised	0	Nil
		[Diffuse	2	1.78 %
Testicular and cord swelling			1	0.89 %
Anterior thigh muscle weakness			3	2.7 %
Wound haematoma "mild"			1	0.89 %
Recurrences			1	0.89 %
Urinary retention			0	Nil

Sixty-seven (59.8%) patients had indirect sacs, in 7 of them cord reduction was done with plastic repair of the internal ring.

Thirty-one (26.7%) had direct sacs with pulging posterior wall in 29 (25%) and funicular sac in 2 (1.7%). Ten patients (8.9%) had direct and indirect sacs, in 2 of them indirect sacs seen as small whitish convex crescent at the internal ring. Four patients (3.6%) had bilateral direct sacs. Right sided hernias were predominated (68%).

All patients discharged home within 3-5 hours after operation. Five patients (4.46%) were lost after 3 months follow-up because of change of phone number or change of address.

Postoperative complications (Table 3).

No mortality, no recurrence, no prosthesis required removal and no persistent sinus developed in this trial. There was no urinary, pulmonary, cardiac or CNS complications and deep venous thrombosis. Anterior thigh muscle weakness occurred in one case (0.89%). Full strength returned within 3 hours. Testicular and cord swelling occurred in 3 cases (2.7%), resolved within 14 days leaving a

normal testis. Mild wound haematoma occurred in one case (0.89%), resolved spontaneously. Superficial localized redness (stitch pastule) occurred in 2 cases (1.78%) and diffuse redness in one case (0.89%) resolved with antimicrobial therapy within 4 days.

Postoperative pain (Fig. 8)

Of the 112 patients, 21.4 (24/112) required no pain killers after the first night and 58% (66/112) took oral analgesia for 1:7 days. After one week about 80% required no further analgesia. Patients over age of 50 years took analgesics for a mean of 5.8 days. Those 50 years and under for a mean of 7.5 days.

Return to work (Fig. 9)

In this trial, office workers returned to work in a mean of 12 days, median 10 days, with 46.2% returning to work in 9 days or less.

Manual workers took a mean of 21 days, median 17 days with 56.5% returning to work in 2 weeks or less.

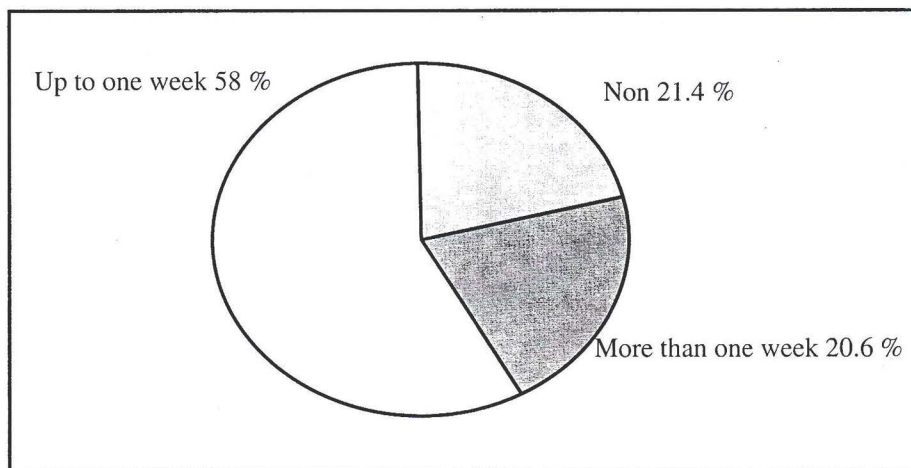


Fig.(8): Postoperative pain (use of analgesics)

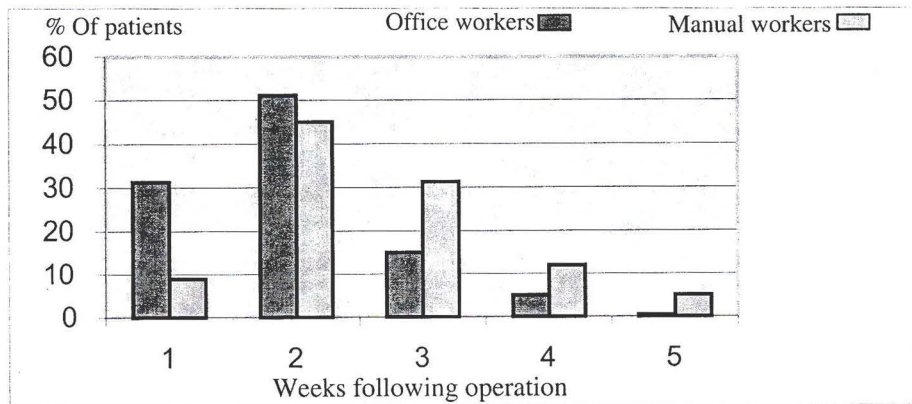


Fig.(9): Return To Work

DISCUSSION

It is customary to give a general anesthetic when repairing an inguinal hernia. The alternative use of a local anesthetic is steadily gaining ground (12) and eventually it may become the anesthetic of choice (13). A recent study reports on the feasibility of laparoscopic extraperitoneal herniorrhaphy under local anesthesia (14). Local anesthesia (5) avoids the risks of general anesthesia, the interval between operations in the operating theatre is lessened, a conscious patient can be asked to cough to identify an evasive hernia or to test a repair and the patient can walk out of the operating theater with prolonged postoperative analgesia. Several safe and effective local anesthetic agents are currently available. Our choice is 3:2 mixture of 1% lidocaine and 0.5% bupivacaine with 1/250.000 epinephrine. Our study has demonstrated how successfully inguinal hernia repair can be done using local anesthesia with 100% success rate and excellent patient satisfaction. The most widely used methods of primary inguinal hernia repair in British Hospitals consist of a Bassini repair (15) or a darn (16). These methods have a reported recurrence rate of between 5% and 15% depending on the experience of surgeon. Nyhus and Condon reported that the Shouldice technique is a meticulous four-layer modification of Bassini method and its success is derived from accurate identification of anatomic layers and personal expertise. The results of Shouldice method have demonstrated a recurrence rate of 1-2% both in Canada by Glassow (18) and in the UK by Devlin et al, (19). These results are invariably reported by surgeons with an interest in hernia repair in specialized centers or units practising a standard techniques (15-16-17-18-19) and therefore the true recurrence rate in general hospitals is underestimated. Lichtenstein challenged the concept of both plication-darn technique and shouldice operation and

introduced "only sutured polypropylene mesh tension-free hernioplasty which did not rely on muscle tendon union. This technique has been thoroughly evaluated over the last 15-years, and in several recent series of over 10.000 cases have shown recurrence rates of 0.2% and infection rates of 0.03% (2-6-7-11-20-21). Kark et al, (22) postulated that the tension-free technique under local anesthesia provided a rational approach to inguinal hernia repair. The reproducibility of the superb results by this technique outside of the Lichtenstein clinic was confirmed in two subsequent publications analyzing the incidence of wound infection, mesh rejection and recurrence rate of non expert surgeons (23-24).

In this trial no recurrence occurred. No mesh required removal, no persistent sinus developed and no deep infection occurred. Only one case (0.89%) developed diffuse redness and swelling of the wound, resolved within 4 days with antimicrobial therapy, and 2 cases (1.78%) developed stitch pastules, resolved after removal of the offending stitch. Thus we are in agreement with other authors and we attribute this to sharp dissection, gentle manipulation, proper application of the mesh and prophylactic antibiotic regimen.

Also, in this trial there are no urinary retention, no pulmonary or cardiac complications, no deep venous thrombosis and no nausea nor vomiting. We attribute this both to the improved immediate mobility afforded by a repair made without tension and to the avoidance of general anesthesia. Anterior thigh muscle weakness occurred in one case (0.89%), this has been reported with potentially serious consequences (25). It is probably due to local anesthetic tracking along the fascial planes and recovery is complete within 3 hours. All patients returned home the same day

without incurring hospital bed costs as the surgical and anesthetic techniques allow rapid return to walking and normal household activities which is encouraging to the patient and decreasing the postoperative pain and allow early return to work. These results no doubt testify to the simplicity and reliability of the Lichtenstein repair using local anesthesia by surgeons with no interest in hernia surgery.

CONCLUSION

Inguinal hernia repair using tension-free monofilament polypropylene mesh under local anesthesia is: simple, safe, effective, substantial cost savings, gives better control of postoperative pain, early return to work and very low rate of recurrence and complications and should be emphasized for ambulatory hernia repair.

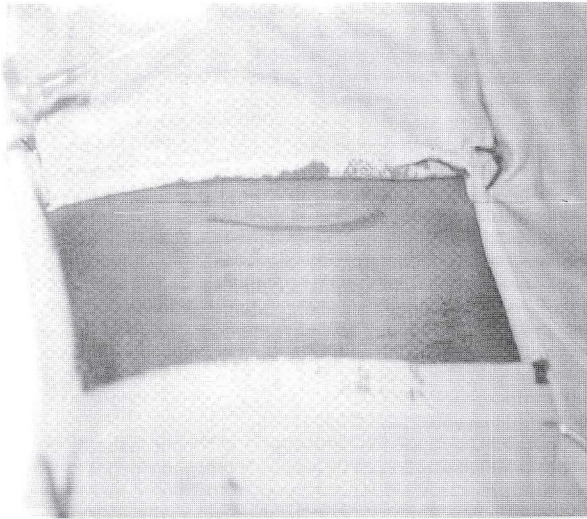


Fig. (1): Line of incision.

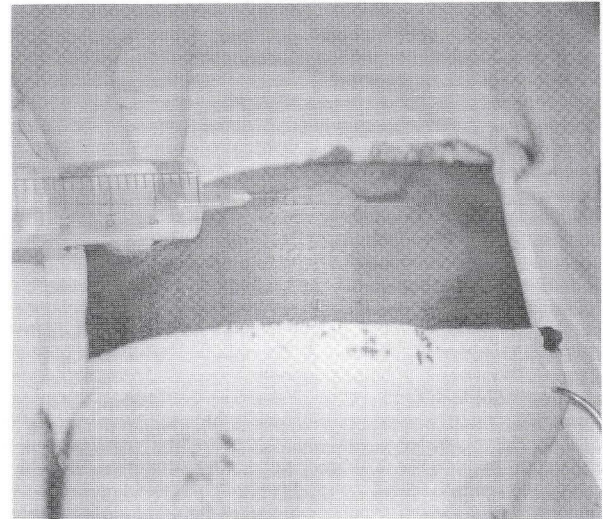


Fig (2) :Intra dermal infiltration.

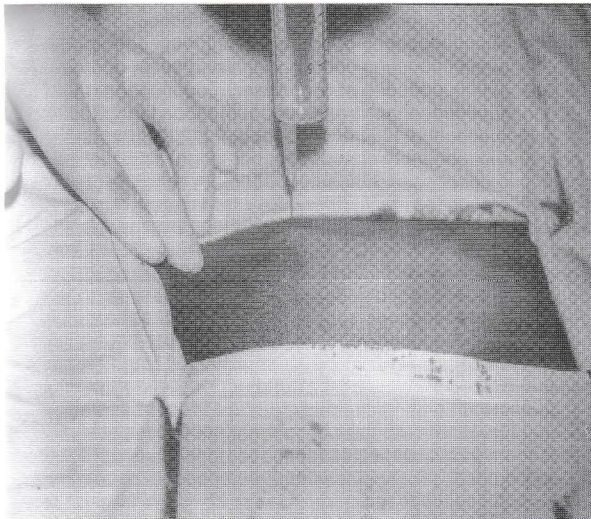


Fig.(3): Subcutaneous infiltration by Vertical insertion of the needle, 2cm apart.

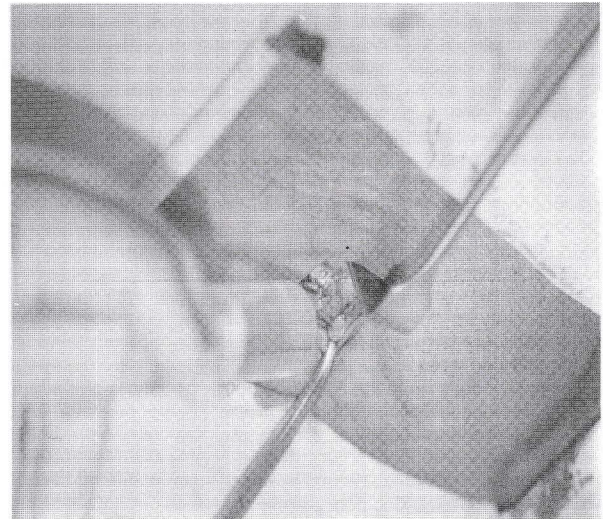


Fig.(4): Infiltration of the inguinal canal.

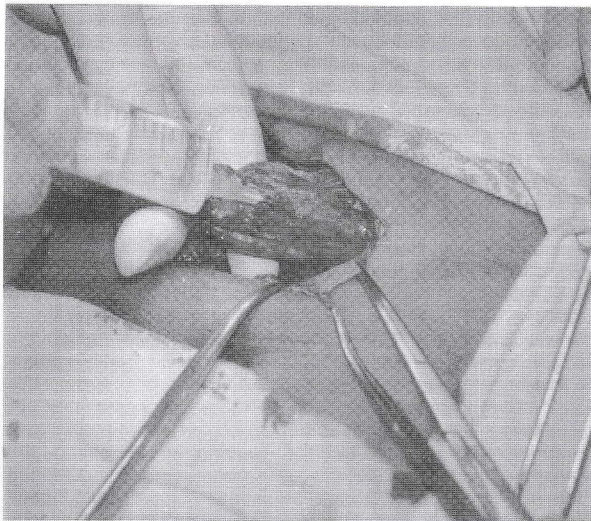


Fig.(5): Infiltration of the cord.

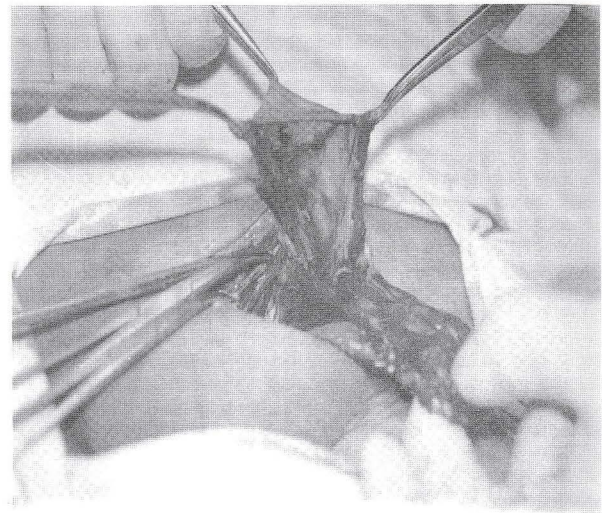


Fig.(6): Complete dissection of the sac.

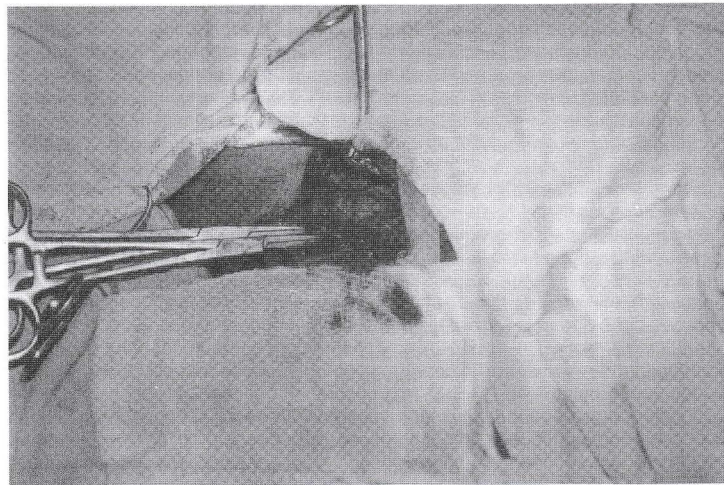


Fig.(7): Application of the mesh.

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