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Original Article

Early and Late Postoperative Complications after Inguinal Hernia Repair A Retrospective Study

Ali Al-Gamrah and Mohammed Arumiama
Kuwait University hospital, University of Sana'a – Yemen

Abstract

The aim of this study was to evaluate our experience in inguinal hernia repair concentrating on early and late postoperative complications. Male patients, who underwent hernioraphy during the period of 1990 to 1997 were evaluated. 574 patients had indirect inguinal hernia repair, 328 patients had direct inguinal hernia repair and 104 patients had both (total 1006 male patients). A standardized Bassini-Procedure (Kirschner modification) was used to repair the tissue defect. 770 Patients could be included in the follow–up, which consisted of outpatient interviews; the review interval ranged from 2 to 7 years. Early postoperative complications consisted of hematoma (1, 23%), seroma (2,72%), suture granuloma (2,46%), wound infections (3,89 %), respiratory tract infections (1,23 %), dysuria (16, 8 %) and deep vein thrombosis (0,26%). The late postoperative sequelae were chronic inguinal pain (5,06 %), hernia recurrence (4,54%), sensation defects of the skin (3,76%), elevation of the testicles (1,43%) and testicular atrophy (1,17%). There were no operative or postoperative deaths.

This was the first study of its kind in Yemen. These results are similar to those of comparable studies in other countries. We conclude that these results (despite the high hernia recurrence of 4.54%) are superior to those of other hospitals in Yemen, which suffer from poor general circumstances and surgical management.

Keywords Hernia, Bassini- Kirschner repair, complications

Review of literature:

As a result of the progress in the anatomic knowledge during the eighteenth and early nineteenth century, due to the discoveries of A. Richter (1742-1812) and I.C. Dietrich (1778-…..), the surgical treatment of the hernia repair made most important progress. In 1887, the modern anatomic hernia surgery was usered in by Edwardo Bassini (1). The treatment of inguinal hernias has evolved over the past 150 years from truss support with operation reserved for life threatening situations to elective outpatient repair (2). The following techniques may be considered important for the reconstruction of the inguinal canal:

- Division of the floor of the inguinal canal (Marcy, Bassini)
- Legation of the hernial sac (Championniere, Marcy, Bassini)
- Resection of the cremaster muscle (Bassini)
- Use of the iliopictineal ligament in the absence of the inguinal ligament
- (Lotheisen, McVay)(3)
- Realization of the importance of the ilio-pubic tract, the so called bandelette of Thomson (dynamic double breaking of the co-joint tandem) (Franchard, Condon)
- Closure of the inguinal floor (marcy, Bassini, Halsted, McVay) (4)

•The contribution of the schouldice repair was important during the 1930's.

Corresponding Author: Ali Hassan Al-Jamrah, University of Sanaa, Republican Teaching Hospital Phone: 777104202- Postal Address:P.O Box 14004

It has been during the 1990's that the treatment of groin hernia underwent revolutionary modifications, for instance, following the introduction of the concept of "tension free" hernia surgery. Traditional suture-based repairs (i.e., Bassini, Halsted, MacVay and Schuldice) haven given way to prosthetic based repairs (i.e., Lichtenstein: plug and patch and laproscopy) (5). As a result, commonly accepted postoperative complications, including urinary retention, ischemic orchitis and severe discomfort, to name a few, have begun to disappear from the hernia surgical scene. In addition, very often honored hernia-related shibboleths are being abandoned (6).

Groin hernia repairs has gone a long way over the last twenty years. A greater understanding of the complex anatomy of the inguinal region and a knowledge of the convergence of tissue planes is essential for the surgical cure of hernia. (7)

Finally, no disease of the human body belonging to the province of the surgeon, requires in its treatment a better combination of accurate anatomical knowledge with surgical skill than hernia in all its varieties.

Background:

The surgery of inguinal hernia is the most frequent operation in general surgery in both developed and developing countries. In our Institution the Department of General Surgery has a capacity of 60 beds with a share of 30 % of the patient population hospitalized for inguinal hernia repair. The short and long term results of the operations are described and analyzed in this article. Results are based on meticulous follow-up investigations which up to now have sparely been performed systematically in an Arabic country. The focus of our attention is on the occurrence of hernia recurrences in comparison with other current

methods generally in the order of 2-3 %, and special Hernia Clinics like the Shouldice clinic in Canada, which reached a recurrence rate of less than 1%. (2)

Patients and Methods

The operative procedure: The famous clinical scientists and surgeons BASSINI and HALSTED (1) independently described already in the year 1890 a standardized operative method for correction of the inguinal hernia which was modified by Kirschner in 1931 (1, 8, 3): The spermatic cord is now transported to the subcutaneous layer in order to improve the strength of the dorsal wall of the inguinal channel. We use the BASSINI-KIRSCHNER procedure (5, 3) routinely since 13 years for repair of inguinal hernias in adult men. Instead of removing the cremaster muscle we split its fibers. Inconstant preperitoneal lipomas (found in 70% of the patients) were removed routinely.

Steps: In the reviewed cases the following steps were uniformly performed by the involved staff: After incision of the skin between the inner inguinal ring and the pubic tubercle, the superficial epigastric vascular bundle was ligated with resorbable 3/0 suture material like CROMGUT® and DEXON®. After the exposure of the external aponeurosis, this tissue layer was splitted in fiber direction from the external to the internal inguinal ring. Below the external aponeurosis the surrounding tissue was bluntly dissected. Thereafter the spermatic cord was surrounded by a plastic loop and mobilized. After that maneuver the dorsal wall of the inguinal channel is still only partially exposed. The fibers of the cremaster muscle were then interiorly and medially splitted. In indirect hernias the hernial sack could now be identified and dissected. For exposure it was located from the situs with two atraumatic anatomical clamps and opened. The neck of the hernial sack was then occluded with a purse-string suture of DEXON® 3/0, VICRYL® 3/0, or occasionally of silk 3/0 as far proximally as possible. After closure of the neck the sack was excised and the inconstant lipoma removed by trans-section and ligature at it's base as proximal as possible where care had to be taken to avoid the ilioinguinal nerve. Now the BASSINI suture was performed which consisted of 4 to 6 single threads out of ETHIBOND ® 1/0 or PROLENE ® 1/0. The first of two

stitches with the same suture were to be conducted through the pubic tubercle. All these single sutures were initially fixed with clamps and then knotted together in a second step.

The internal oblique muscle and the transverse abdominal muscle were sutured to the inguinal ligament. According to BASSINI (1), directly above the sutures, the external fascia was adapted with continuous 2/0 DEXON ® or VICRYL ® suture. During the ongoing procedure the spermatic cord was displaced upwards and then positioned subcutaneously. The external inguinal ring became completely obstructed. As a result, The inguinal floor was replaced by an S-shaped channel for the spermatic cord arising from the deep inguinal ring which in turn had been displaced laterally and superficially. The deep inguinal ring was narrowed to give passage just to the index finger tip. Drainage was only performed in individuals predisposed for hematoma. Wound closure was performed using 2 to 3 subcutaneous 3/0 PLANGACUT® sutures and by skin suturing with silk.

Patients: From 1990 to 1997 we performed hernia repair on 1470 patients suffering from inguinal hernias. 90 patients had bilateral hernias. 1098 male and 80 female patients were adults, the ballance were children of both sexes.

During the mentioned period of seven years, nine surgeons were performing the procedure. In 92 cases the procedure was done for recurrent hernia, exclusively male adult patients.

Our analysis is based on the 1006 primary procedures of male adult individuals, with regard to early and late complications after the application of the Bassini-Kirschner method. 574 patients were found to have indirect hernias, 328 patients had direct hernias and 104 patients had combined hernias of both types.

568 of the hernias were right-sided, 348 left sided and 90 bilateral. There was a preponderance of old age. The age distribution is depicted in figure (1).

Spinal anesthesia was applied on 712 cases (71%) while 249 operations (25%) were performed under general anesthesia. In 45 cases (4%) local anesthesia was applied. 41 patients were operated under emergency conditions with acute presentations (i.e. ileus, gangrene). They were delivered to the hospital with abdomen signs, suffering from hernia strangulation. 30% of them were delivered with severe ileus symptomatic. 11 cases, which were transported from far rural areas, were having gangrene and were subject to intestinal resection. Two other patients were suffering from sliding hernia with coecum and inflamed appendix. One patient had lettres hernia. Six of the remaining 27 patients had huge sectoral hernia wit obstruction dysuria not reducible. The balance 21 cases came with obstructed hernia which could still be reduced.

Thrombosis prophylaxis in form of drug and stocking was not given. The patients were mobilized immediately after the operation. The patients shaved their inguinal area themselves. Emergency cases and handicapped people or very old patients got nursing assistance.

Postoperative Evaluation

Follow-up was based on a written questionnaire (table 1). In the case of analphabets this was read to them during the consultations. The answers were documented by the physician. Data from 770 of 1006 eligible patients could be retrieved during the study period (76,5%). Remaining cases were unreachable for the research team mostly due to geographic constraints. Of those cases, 30 required treatment because of persistent pain in the scar area with one third experiencing typical radiation in the secrotal sac.

Results (early and late complications)

All patients survived the operation in the short and in the long term (2-7 years).

After inguinal hernia repairs we registered the following complications: hematoma (10 cases, 1.23%) seroma (21 cases= 2.72%) superficial wound infections (30 cases= 3.89%), deep leg vein thrombosis (2 cases= 0.26%), neck pain (10 cases= 1.23%), bronchitis (10 cases= 1.23%),

dysuria (130 cases=16.8%) and suture granuloma (20 cases= 2.46%) (figure 4). As draw back, 9 patients suffered from atrophy of the testicles, which may had been caused by too tight inguinal ring.

Late complications, after the first postoperative year, were local paresthesia of the skin (29 cases= 3.76), chronic pain in the inguinal area of the side of operation (39 cases= 5.06%), elevation of testicles (11 cases= 1.43%), atrophy of testicles (9 cases= 1.17%), and recurrences of inguinal hernias (35 cases= 4.54%).

To perform diagnostics for the hernia recurrence, patients history, ultrasound examinations and clinical examinations were performed. It should be mentioned that our recurrence rate totaled 4.6%, which is considered as high score for Bassini.

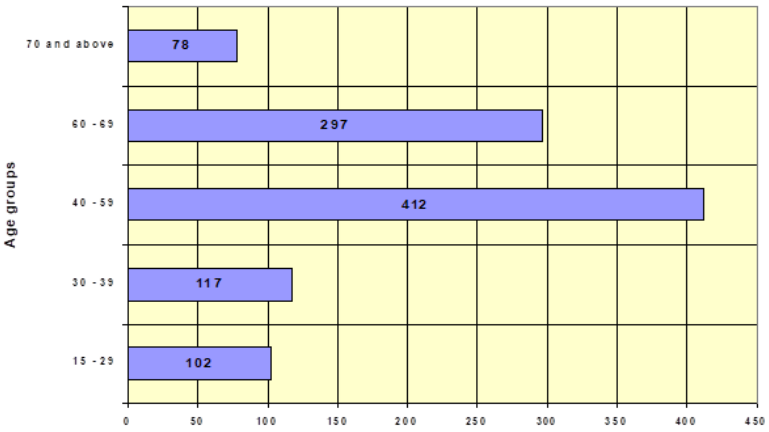

Figure 1 : Numbers of patients and age distribution of 100% male patients operated because of a primary inguinal hernia

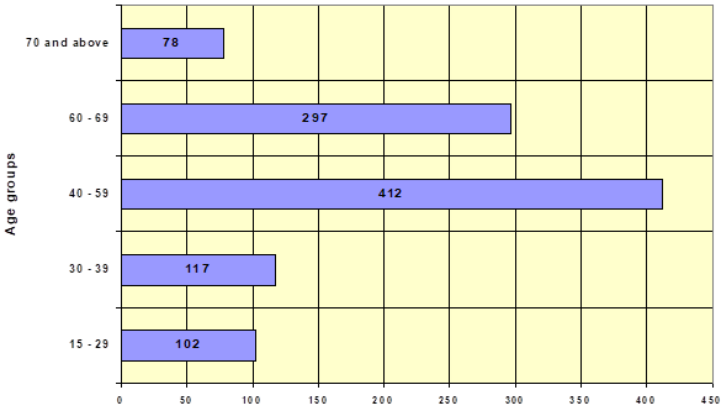

Figure 2 : Numbers of patients and age distribution of 100% male patients operated because of a primary inguinal hernia

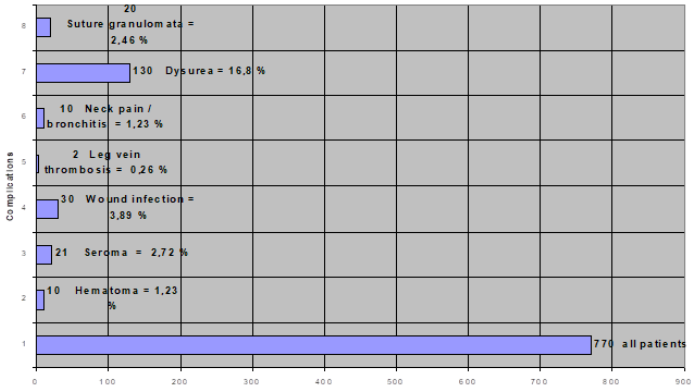

Figure 3:Early complications (during the first post operative year) after hernia repair

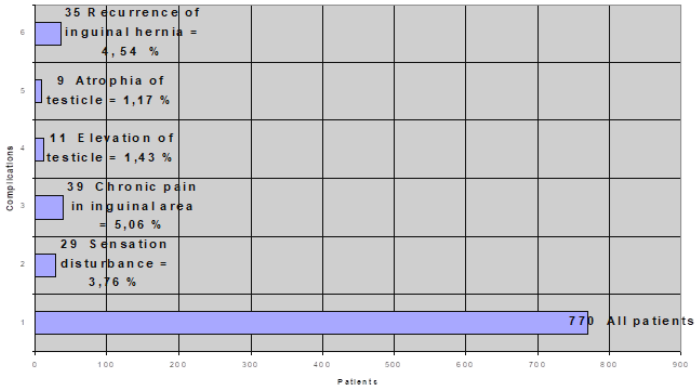

Figure 4: Late complications (from second year post operative) of hernia repair

Discussion

Our thirteen years lasting experience with 1006 cases proved the efficiency and the good results which can be obtained through the standardization of the Bassini-Kirschner technique. Primary groin hernia has many reasons like emphysema, persistent cough, prostate hypertrophy and colorectal obstruction need adequate treatment. For the remainder the quality of the hernia repair remains the only variable for recurrence, which are not affected by human behavior, while the recurrence of groin hernias is universally controllable by relatively simple means(13). Patients undergoing hernioraphy have the right to assume that the repair will last for the remaining of their lifes. It is the surgeon's responsibility to deal with these expectations(13).

The Bassini-Kirschner hernioraphy technique is a safe, simple and sound procedure for the repair of adult groin hernias(16). This operation can be performed as an outpatient procedure or as one night stay surgery(14).

The current sample investigations features a considerable number of cases rarely reported in recent years. The elimination of female patients from the follow-up homogenized the group with regard to the recurrence data. As of anatomical reasons recurrence is a very rare event . Furthermore it is much easier in the countries with Arabic tradition to get in contact with male persons.

Uniformly a Bassini–Kirschner approach has been employed throughout the study period in the Kuwait University hospital. Therefore the results we reached were better than the results normally reached in Yemeni Hospitals. This is to stress that the standardization of the method and the experience of the surgical team are crucial factors to reduce hernia recurrences.

In spite of the two positive factors prevailing in the team work (namely the standardization of the method and the experienced team) at the Kuwait Hospital, which is subject to this follow up study, most of the other work circumstances of Yemeni Hospitals were valid here as well.

Generally all over Yemen a diversity of methods mostly poorly standardized are applied; it is not rare that even in the same hospital, completely different techniques are parallelly used. This has two main reasons: firstly Yemeni surgeons received their postgraduate training in different countries such as Arabic Countries, former Socialistic Countries, and the Western World. In addition, many surgical departments have a tendency to delegate hernia-operations to inexperienced house officers as they are often aggravated by a considerable lack of surgical specialists. These conditions have a negative influence on the hernia recurrence rate. We did not see any relation between recurrence rate and the age of the patients. Due to the mentioned work circumstances, the hernia recurrence rates were expected to be higher than international average.

These hard circumstances may be described in the following:

1.The Patients were mostly (80%) poor uneducated people of rural origin. Their clothes were dirty, they suffered also from poor general health, their personal cleanliness was mostly poor and their cultural background was often underdeveloped.

2.The operating staff members, apart from the experienced surgeons, were mostly not specialized, not well trained and lacked sufficient experience. The female nurses were wearing the sterilized clothes simply on top of their street garments, they keep their mouth coverings from outside the operation area and use it more than once.

3. The material circumstances:

•The surgical tools and instruments were old and often not in a perfect shape. They were kept too long in use and not replaced systematically.

•The sterilization was done by boiling the tools and using hot air sterilization.

•Working materials were not usually available in full range. Surgeons had to work with whatever material available, with no optimization possibility. For example

operations were often performed regardless of the available suture thickness or quality.

To prevent recurrences it is necessary to exclude any tension of the tissue. To secure a tension-free inguinal channel and to strengthen the walls also synthetic materials (mesh or plugs) are internationally used since more than 10 years. The so called tension free repair lowers the recurrence rate close to one percent, but concerns about infection, shrinkage and resorption of meshes have been growing ever since their introduction. Recently also the application of endoscopic extraperitonel repair became popular. But this method should currently be restricted to specially experienced surgical teams.

29 patients (3,76%) paresthesia in the area of wound scar and 39 patients (5,06 %) had chronic pain in the inguinal area. We believe that during splitting of the cremaster muscle the ilioinguinalis nerve has been damaged or irritated trough postoperative scarred changes. In 11 cases (1,43%), an elevation of testicles without signs of atrophy was noted.

For the operative technique it must be emphasized that after treating of the hernia bag with a tobacco pouch suture the Bassini stitches are performed as 4 to 6 single sutures. The first stitch always takes the periost of the pubic tubercle . The testicular cord is positioned subcutaneously. As consequence of this the extern inguinal ring must always become occluded. Children are excluded from occlusion of the external inguinal ring, because they are still growing and their spermatic cords are not transferred as practiced with adults.

In our hospital it became a rule, that all inguinal hernia procedures are performed by experienced surgical specialists under the assistance of also experienced residents. Even though the Bassini method is currently internationally not en vogue it may serve as an example in which way standardization my affect outcome. The cost of prosthetic meshes prohibits its use for most Yemeni patients. However even in the developed world the use of meshes is strongly discussed.

At mortality and morbidity conferences, we discuss the rate of hernia recurrences in male adult individuals and complications. We try to compare the results with those of other hospitals and to focus on the operative technique. This is a first step for quality assurance in regard of inguinal hernia repair in our country. International comparisons are still difficult, because surrounding conditions for operations in our country must on many places still be criticized, like sepsis, antisepsis, hygiene behavior and organizational factors.

Recommendations

1) Because of alifferent views an the procedures adopted in repair of hernia it is recommended that a group of surgeons should specialize in this field . This will help in gaining move experience and lead to the development of are or move acceptable procedures .

2) There is need for move opportunities for the exchange of views and assessment of results obtained in different carters .

3) Better records of details should be developed on the results of different procedures

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