

Current options in inguinal hernia repair in adult patients

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Abstract

Inguinal hernia is a very common problem. Surgical repair is the current approach, whereas asymptomatic or minimally symptomatic hernias may be good candidate for watchful waiting. Prophylactic antibiotics can be used in centers with high rate of wound infection. Local anesthesia is a suitable and economic option for open repairs, and should be popularized in day-case setting. Numerous repair methods have been described to date. Mesh repairs are superior to “non-mesh” tissue-suture repairs. Lichtenstein repair and endoscopic/laparoscopic techniques have similar efficacy. Standard polypropylene mesh is still the choice, whereas use of partially absorbable lightweight meshes seems to have some advantages. Hippokratia 2011; 15 (3): 223-231

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Inguinal hernia repair is probably the most common procedure in general surgery. It is also one of the earliest operations in a junior surgical resident's postgraduate training period. Numerous repair techniques have been described to date, however tension-free mesh repairs are widely used methods today because of their low recurrence rates.

Inguinal hernia repairs consume an important part of health care resources because of the high incidence of the problem. It is estimated that 20 millions of inguinal hernia repairs are performed globally every year¹. Every recurrence after a primary repair will add an extra cost to health care economics. Moreover, secondary or tertiary operations after previous repairs carry higher risk of re-recurrence and specific complications like testicular atrophy. Therefore, every surgeon should know and perform a current repair method successfully in his/her daily practice.

Approximately 75% of all abdominal wall hernias are seen in the groin¹. Inguinal hernia is much more common in men than women. Although femoral and umbilical hernias are more common in female population, indirect inguinal hernia is still the most common type of hernia in women. Age is a factor for incidence and type of inguinal hernia; incidence increases by age². Indirect hernia is more common in young and direct hernia in the elderly.

Repair or wait?

Traditionally almost all inguinal hernias are referred for surgical treatment following diagnosis. Progression of a hernia by time is natural and most surgeons prefer repairing all inguinal hernias as soon as possible. Inguinal hernia is a benign disease and its repair results in only rare and minor complications in elective setting. Nevertheless com-

plications developed after emergency repairs may be more dramatic and frequent, even mortality may be recorded^{3,4}. It is especially so if patient is elder^{5,6}. Therefore a repair in elective setting is recommended generally.

On the other hand, a limited number of recent papers have reported that watchful waiting is a safe and acceptable option for men with minimally symptomatic or asymptomatic cases⁷⁻⁹. The authors concluded that hernia accidents like incarceration or strangulation occur rarely and can generally be treated uneventfully. Also, delay in treatment does not increase the complication rates. On the contrary, a Scottish team reported that a painless inguinal hernia develop symptoms over time, therefore, surgical repair is recommended for medically fit patients with a asymptomatic hernia^{10,11}.

Today, inguinal hernias can be treated with very low complication rates. Open repairs like Lichtenstein operation can be performed with local anesthesia in a safe and economic way¹²⁻¹⁴. Laparoscopic repairs are also very attractive options for patients. Therefore most inguinal hernias are still repaired without any observation unless the general condition of the patient is very poor.

Classification

More than 10 classifications have been described to date. They have similarities and differences, but generally meet at complexity and difficulty in remembering. Probably the most frequently used classification is Nyhus classification^{1,15}. It describes almost all types including pantaloon and femoral hernias, and gives attention to recurrent hernias. Gilbert classification is easier but lack the description of combined and femoral hernias¹⁶.

Aachen classification that developed by Schumpelick and colleagues is based on an easy system¹⁷. It mentions

Table 1: The EHS groin hernia classification.

EHS Groin Hernia Classification	Primary		Recurrent		x
	0	1	2	3	
L					
M					
F					

From: Miserez M, et al. The European hernia society groin hernia classification: simple and easy to remember. *Hernia*. 2007;11:113-6.

both anatomical location (indirect or lateral vs. direct or medial) and size (<1.5 cm, 1.5-3.0 cm, >3 cm.) of hernia. The European Hernia Society (EHS) Board, including Prof. Schumpelick, recently agreed on a new classification based on Aachen system and asked all surgeons practicing hernia surgery to report the class of the hernia in the operative reports¹⁸ (Table 1).

EHS classification defines the location of hernia with L: lateral, M: medial, and F: femoral. The size of hernia is indicated with 1: ≤one finger, 2: one-two fingers, and 3: ≥three fingers. If the patient has two types of hernia together (e.g., direct+indirect, direct+femoral, indirect+femoral) appropriate boxes in the table are ticked. In addition, P or R letter is encircled for a primary or recurrent hernia.

No matter which classification system is used the type of hernia should be recorded according to intraoperative findings. It is important to describe each side separately and clearly for bilateral hernias.

Which type of anesthesia?

Virtually all anesthetic methods have been used in inguinal hernia repairs (Table 2). General inhalation anesthesia is still most common method in most institution

Table 2: Anesthetic options for inguinal hernia repair.

Type	Pros	Cons	Notes
General	Most frequently used Widely available	More expensive Generally requires an overnight stay	Mandatory for endoscopy/laparoscopy
Spinal	Can be used for outpatient Less postoperative pain	Prolonged motor block, delay in mobilization Urinary retention Headache	Not recommended in severe cardiac disorders
Epidural	Suitable for outpatient Less postoperative pain Earlier mobilization than spinal anesthesia	More difficult to apply Urinary retention (less than spinal anesthesia)	
Local	More economic Suitable for outpatient Shorter time in operating room Earliest mobilization Least postoperative pain	Operating room fear Socio-cultural reasons Unfamiliar to most surgeons	Best for frail patients

and always the method for endoscopic/laparoscopic repairs, whereas local anesthesia is more frequently used by surgeons with specific interest to herniology. Surgeons feel themselves more comfortable and free when their patients are received a full anesthesia. However, local and regional anesthesia has certain advantages for patients. These two techniques have the advantage of preemptive analgesia and cause less oxidative stress¹⁹. Whole field was blocked before, and patients do not feel any pain during the operation. This will provide a much more comfortable postoperative period.

Another advantage of avoiding general anesthesia is a having conscious patient during the operation. Patient can give a cough to increase intraabdominal pressure during exploration or checking the safety of repair. Local anesthesia is also considered as an assurance for more delicate surgical manipulation. Surgeon will have to dissect the tissues gently and the assistant will have to retract the wound edges with caution.

Local anesthesia has been found to be related to shorter time spent in the operating room, lower incidence of nausea and urinary retention, and more satisfaction. Patients received local or regional anesthesia need less postoperative analgesics and length of hospital stay are less than general anesthesia cases²⁰. However, local anesthesia has been found to be superior to regional anesthesia²¹. Spinal anesthesia causes urinary retention frequently. Patients received spinal anesthesia is generally not happy with motor block that render them unable to stand up and walk for a while. Epidural anesthesia has better outcomes for last two parameters²².

Today, a step-by-step infiltration technique is the widely use method for establishing local anesthesia, and dose of anesthetic agents can be always kept in the limit of confidence¹⁴. Intravenous mild sedation should also be added to maximize intraoperative comfort. Local anesthesia is easy to learn and apply, and surgeons should be encouraged to use it in open anterior repairs for health

care economics. It is even available in overweight and obese patients without dose related complications^{14,23}. In EHS's view, local anesthesia is suitable for open repairs, should be considered in ASA III/IV patients, however it cannot be possible in young anxious patients, morbid obesity, incarcerated hernia²⁴.

In respect of postoperative anesthesia-related complications local anesthesia seems to be more advantageous than its counterparts. Urinary retention rate is much lower in local anesthesia. It is also free of severe headache which is seen after spinal anesthesia.

Is antibiotic prophylaxis necessary?

Inguinal hernia repairs are clean surgical procedures where antibiotic prophylaxis is not recommended for routine use. In conventional hernia repair (non-mesh), antibiotic prophylaxis does not significantly reduce the number of wound infections²⁴. However for the last two decades, use of prosthetic materials has significantly increased due to their low recurrence rates and prophylactic antibiotic use has become more common. Theoretically there would be an increased risk of surgical site infection when a foreign body such as a prosthetic mesh is used, but routine antibiotic prophylaxis is still controversial²⁵.

Most recent Cochrane meta-analysis on antibiotic prophylaxis in inguinal hernia repair in which seven of thirteen trials were mesh repair series concluded that "administration of antibiotic prophylaxis for elective inguinal hernia repair cannot be universally recommended"²⁶. In addition, it has been stated that antibiotic prophylaxis cannot either be recommended against when high rates of wound infection are observed. European Hernia Society guideline for inguinal hernia repair also states that "In clinical settings with low rates (<5%) of wound infection, there is no indication for the routine use of antibiotic prophylaxis in elective open groin hernia repair in low-risk patients."²⁴ However antibiotic prophylaxis in the centers with high rates of infection (>5%), and also for high-risk patients (e.g., advanced age, recurrent hernia, steroid use, immunosuppression, expected long operating time, use of drains, emergency repair, etc.) is still practically in use in many institutions.

Yerdel et al found a 10-fold decrease in overall wound infection rate when single-dose, intravenous ampicillin-sulbactam was used during Lichtenstein hernia repair²⁷. However, a large number of evidences say that first generation cephalosporins should be the choice when the surgeon decides prophylaxis. A single dose intravenous administration 30 minutes before the incision is sufficient. Oral route for antibiotic prophylaxis can be a safe alternative which decreases the costs^{28,29}. Antibiotics are not continued postoperatively.

Topical antibiotics have also been tried in some institutions. A recent prospective randomized study found that topical gentamicin into the wound is equivalent to intravenous gentamicin³⁰. In an earlier paper, Lazorthes and colleagues had reported that single dose cefamandole delivered directly into the operative wound signifi-

cantly decreased infection rate in comparison with control subjects where no antibiotics given at all³¹. However, both studies need additional support by further trials which compare topical antibiotics with single dose intravenous cephalosporins. The most impressive results were published by Deysine³². One gram of intravenous cefazolin administered 1 hour before surgery plus frequent wound irrigations with a solution of 80 mg of gentamycin sulphate dissolved in 250 ml of normal saline solution yielded a remarkably low infection rate of 0.11% in over 4,000 elective inguinal hernia repairs. This institution worked more than 20 consecutive years without one single surgical site infection after above mentioned prophylaxis regimen.

Which repair technique?

Numerous repair techniques were described since Eduardo Bassini had published his first anatomy-based repair with great success in 1890. During the 20th century, the repair trend was changed several times. A summary of current repair options for inguinal hernias are presented in Table 3.

Although Shouldice Hospital achieves a very low cumulative recurrence rate by performing its own tissue-suture technique³³, today prosthetic repairs are accepted to be superior to "non-mesh" suture repairs. A recent metaanalysis revealed that Shouldice herniorrhaphy is the best non-mesh technique in terms of recurrence, though it is more time consuming and needs a slightly longer post-operative hospital stay. Nevertheless, the use of mesh is associated with a lower rate of recurrence³⁴.

"Non-mesh" repairs may be considered as an option in women. Transversalis fascia is often quite strong in women and indirect hernias in these patients can be treat-

Table 3: A classification of current repair techniques for inguinal hernias.

A.	Tension-free prosthetic repairs
1.	Anterior repairs
a.	Lichtenstein repair and its modifications
b.	Plug repairs
c.	Patch and plug repairs
d.	Double-layer devices
2.	Posterior (preperitoneal) repairs
a.	Open techniques via inguinal incision
b.	Stoppa repair
c.	Laparoscopic/endoscopic repairs
i.	Transabdominal preperitoneal
ii.	Total extraperitoneal
B.	Tissue-Suture repairs
1.	Bassini-Shouldice technique and its modifications
2.	Marcy repair

ed without a mesh³⁵. Marcy repair where internal inguinal ring is narrowed by one or a couple of sutures is also rarely used in certain cases with a small indirect hernia and a normal-size internal ring.

Different mesh techniques have been described to date. Single and double layer meshes, and plug repairs all have been reported with good results by their users and defenders. However, EHS Guideline has clearly stated that none of the alternative mesh techniques except for the Lichtenstein and endoscopic techniques has received sufficient scientific evaluation to be recommended²⁴.

The use of mesh in emergency repair of complicated hernias is under debate. Recent evidences is in favor of mesh use in cases with incarceration, however prosthetic repair creates a risk for surgical site infection in cases where a gangrenous intestine is met and a resection-anastomosis is required^{36,37}. Suture repairs like Shouldice-Bassini operation are employed in those cases.

Today, some strong recommendations exist in favor of Lichtenstein repair. American College of Surgeons choose this technique for "gold standard"¹², while National Institute of Clinical Excellence [NICE] from UK³⁸ and The National Agency for Accreditation and Evaluation in Health [ANAES] from France³⁹ recommended it for inguinal hernia repair. It is easy to learn and perform⁴⁰. Reasonable recurrence and complications rates have been obtained worldwide. The Lichtenstein Hernia Institute and the British Hernia Centre reported very low recurrence rates in thousands of cases^{41,42}. It is also suitable for outpatient surgery in an economic way by using local anesthesia.

Endoscopic and laparoscopic repairs also provide very good results where surgeons have expertise in the technique. It results in very low postoperative pain, fewer wound infection, and quick return to daily activity and working⁴³. A mesh is placed either with a total extraperitoneal technique (TEP) or a transabdominal preperitoneal approach (TAPP). A Cochrane review found these two approaches equivalent regarding duration of operation, haematoma, length of stay, time to return to usual activity and recurrence⁴⁴. A retrospective comparison in the early years of the techniques reported similar results in general, however major complications like bowel injury was a concern in TAPP⁴⁵. EHS has the opinion that a totally extraperitoneal (TEP) repair is preferred to a transabdominal preperitoneal (TAPP) approach in the case of endoscopic surgery²⁴.

Today a great competition is continuing between open and laparoscopic mesh repairs. Majority of hernia repairs are still done with open techniques. Questionnaires among surgeons revealed that a minority of participants preferred laparoscopic repair for their imaginary unilateral inguinal hernia⁴⁶⁻⁴⁹, whereas Rattner reported that physicians are increasingly choosing a laparoscopic approach for their hernia repairs even when they have primary unilateral hernia⁵⁰.

A review published in 2007 reported that laparoscopic hernia repair is accounted for the minority of hernia

repairs performed in USA and some European and this approach would likely remain a less common operation than open mesh repair⁵¹. NICE, in 2004, stated that only 4.1% of the all inguinal hernias were repaired by laparoscopic technique in the United Kingdom³⁸. This low figure was confirmed very recently by a cross-sectional survey among 784 fellows of the Association of Surgeons of Great Britain and Ireland⁵². A survey of Japanese general surgeons which questioned the standard operation for adult groin hernias showed just a 1% daily usage rate for laparoscopic repair⁵³. In contrast to these two industrialized countries known with conservative life patterns, laparoscopic hernia repair has gained popularity in some North American and European countries. Canadian survey reported that almost half of Canadian surgeons had laparoscopic repair experience and routine laparoscopic repair usage rate was 15% for unilateral, while one third of bilateral and recurrent hernias were repaired with this technique⁵⁴. A German survey including 14 hospitals presented a 30% ratio for laparoscopic repair techniques⁵⁵.

Open and laparoscopic/endoscopic techniques have been compared in a number of studies. First of all laparoscopic repairs are more expensive than open repairs. Hynes et al. reported that laparoscopic repair costs an average of \$638 more than open in North America⁵⁶. Similarly, McCormack et al. reported that laparoscopic repair was more costly to the health service than open repair, with an estimated extra cost from studies conducted in the UK of about 300-350 pounds per patient⁵⁷. A Swedish study revealed that the total hospital cost was 710.6 Euro higher for TEP repair. This difference increased to 795.1 Euro when the further costs associated with recurrences and complications within 5 years were taken into consideration⁵⁸. Khajanchee et al also reported that the cost of TEP repair was \$128.58 more than an open repair⁵⁹. They argued that although the difference could be decreased with minimal use of disposable instruments TEP repair would still appear to be an expensive alternative from the payer's point of view. In contrast, Jacobs and Morrison stated that despite marginally higher procedure-related disposable costs for laparoscopic TEP hernia repair, the institutional income is remarkably higher owing to a better reimbursement for this procedure in ambulatory surgery centers. From the institution's point of view, laparoscopic hernia repair is by far the more cost-effective procedure when compared with an open hernia procedure at the present time⁶⁰.

The classical 14-center VA Study from Neumayer and colleagues revealed that recurrences were more common in the laparoscopic group than in the open group⁶¹. The rate of complications was also higher in the laparoscopic-surgery group than in the open-surgery group, but rates of recurrence after repair of recurrent hernias were similar in the two groups (10.0 percent and 14.1 percent, respectively). The laparoscopic-surgery group had less pain initially than the open-surgery group on the day of surgery and at two weeks and returned to normal activities one day earlier. However this study was criticized by others. Strate et

al. claimed that increased incidence of recurrences may be related not to the laparoscopy but rather to the size of the mesh⁶². In addition, technical experience of some surgeons was not enough yet in laparoscopy group.

A very successful laparoscopic repair team from Germany has published a metaanalysis that compared endoscopic and open repair methods⁶³. They have found that endoscopic repairs have advantages over open repairs in terms of local complications and pain-associated parameters. However, Lichtenstein repair has significant advantages like shorter operating time, lower incidence of seroma formation, and most importantly fewer hernia recurrences.

A Cochrane review comparing laparoscopic and open repairs revealed no apparent difference in recurrence⁶⁴. Laparoscopy seems to cause less persisting pain and numbness. Return to usual activities is also faster. However, operation times are longer and there appears to be a higher risk of serious complication rate in respect of visceral and vascular injuries.

Bilateral hernias are another specific issue. Laparoscopic/endoscopic techniques are good options for these cases^{65,66}. EHS recommends Lichtenstein and endoscopic repairs²⁴. An argument in favor of laparoscopic repair is clinically unrecognized contralateral hernias. Contralateral hernias are found in exploration in about %10 of the cases⁶⁷. Ipsilateral or contralateral femoral or obturator hernias can also be diagnosed during laparoscopy. Griffin et al. reported interesting findings with bilateral laparoscopic exploration⁶⁸. In their series, contralateral hernia was found and repaired in 22% of the cases. In another 20%, the clinical suspicion of bilateral hernia was revised at the time of surgery to unilateral only. Four cases were booked as femoral repairs, one of which was found to be an inguinal hernia. The overall clinical diagnostic accuracy was only 78%.

The British Hernia Center reported that simultaneous inguinal hernia repair can be done with local anesthesia without any increase in recurrence or infection rates, both between 0.5-1%⁶⁹. Dakkuri et al published similar results and found simultaneous repair more economic⁷⁰. However, simultaneous repair of bilateral hernias should be carefully considered for each case. Young male patients with strong muscles may not be good candidates for single-stage repair. They usually complain of postoperative pain at one side. Older patients are more suitable for bilateral repairs with local anesthesia^{13,14}. As a rule, the side where the patient has more complaint should be repaired first, if the surgeon does not find any specific reason not to do so.

It may be better to consider recurrent hernias as a separate group. Meta-analyses revealed that laparoscopic and open mesh repairs for recurrent inguinal hernias were equivalent in most of the analyzed outcomes. Fewer hematoma/seroma formation were observed in the laparoscopic group in comparison with the Lichtenstein group. There is a higher relative risk of overall recurrence with transabdominal preperitoneal approach compared with totally extraperitoneal technique⁷¹. EHS recommendation for recurrent hernias is more straightforward: "Modify

Table 4: A classification of prosthetic materials used in inguinal hernia repairs.

A. Synthetic meshes
1. Heavyweight
a. Polypropylene
b. Polyester
2. Lightweight
a. Nonabsorbable
i. Plain polypropylene
ii. Coated polypropylene
b. Partially absorbable
i. Polypropylene + polyglactine
ii. Polypropylene + polyglecaprone
B. Biologic meshes

technique in relation to previous technique. If previously anterior; consider open preperitoneal mesh or endoscopic approach, if previously posterior; consider Lichtenstein operation²⁴.

Which mesh?

Usher first introduced polypropylene prosthetics for inguinal hernia in the late 1950s⁷², however, the wide acceptance of them took place in 80's following Lichtenstein's report of very successful results⁷³. Meshes have decreased the rate of recurrence significantly, but some problems related to meshes have been reported. As a foreign body, mesh theoretically may increase the risk of infection. However, as mentioned above, surgical site infection is not a big problem in inguinal hernia repairs. Rejection and mesh removal due to chronic resistant infection is very rare.

A hernia mesh has certain features like material, strength, elasticity, density, pore size. Standard polypropylene mesh is most frequently used one. It is cheap, available in most institutions, non-absorbable, and strong enough to avoid recurrence. Nevertheless, some actual problems with mesh use like foreign body sensation and chronic postoperative pain have created a conflict about standard polypropylene mesh. Polyester mesh might be an alternative, but it could not gain popularity. Polyester meshes can degrade by time especially in infected areas⁷⁴.

Newer lighter meshes have been produced to overcome those problems⁷⁵. Nevertheless, all lightweight meshes are more expensive than standard polypropylene mesh. Pure polypropylene light mesh is the most economic option. There are also coated polypropylene meshes in the market. The purpose of the coating is to attenuate the host response to the prosthetic, yet still provide adequate strength for repair⁷⁶. Fish oil, beta glucan and titanium have been used for coating⁷⁴.

When meshes are categorized by density, a mesh with density >100 g/m² is accepted as heavy, whereas a 35-50 g/m² density is classified as lightweight⁷⁴. Several recent controlled clinical studies have suggested that lightweight

meshes may improve patient comfort^{77,78}. Some objective findings in favor of lightweight meshes have also been obtained from laboratory experiments, however some others reported that a lower weight mesh does not correlate with a decreased biological response^{79,80}.

Partially absorbable meshes have two components. Polypropylene nonabsorbable part does not lose its strength at all. The other half is absorbed within 12 weeks⁸¹. Eventually less foreign material is left insitu, while the remaining mesh can still provide a sufficient mechanical barrier against recurrence. Two controlled studies compared standard polypropylene mesh with a partially absorbable mesh in Lichtenstein repair revealed no differences^{82,83}. A single-surgeon study also reported no differences for standard polypropylene, lightweight pure polypropylene and partially absorbable meshes⁸⁴. A recent metaanalysis also found no differences however use of partially absorbable light meshes could be associated with reduced feeling of a foreign body⁸⁵. As the pioneer of the technique, the Lichtenstein Hernia Institute still uses standard polypropylene mesh in inguinal hernia repair.

Lately a specific problem has been introduced for mesh repairs. Some clinical and experimental studies have shown that mesh may cause male infertility due to constriction of the vas deference⁸⁶⁻⁸⁹. Some authors have even proposed that young male patients who undergo inguinal herniorrhaphy using polypropylene mesh need to cryopreserve their sperm for future fertility⁹⁰. On the contrary, Aydede et al. reported that mesh application is a safe procedure in patients with no children or who are under infertility treatment⁹¹. A very recent study from Sweden also has shown that patients undergo bilateral inguinal hernia repair with mesh are not a greater risk of male infertility rate than those operated without mesh⁹².

Kiladze and Gvenetadze developed a modified mesh which isolates spermatic cord from the mesh⁹³. They recommended this mesh especially for bilateral repairs in men. Aachen group proposed the use of low-weight large porous and elastic meshes to protect the integrity of the vas deferens⁹⁴. However, a recent comparative clinical study found no differences between standard and lightweight meshes in respect of sperm motility after laparoscopic repair⁹⁵. Fitzgibbons claimed that infertility is a known complication of inguinal hernia surgery with or without mesh, and surgeons should tell their patients that. However, a return to the routine use of the Bassini operation or one of its nonprosthetic variants will inevitably lead to the need for more reoperative surgery for recurrence, which places the patient at the greatest risk of loss of fertility as a consequence of testicular atrophy⁹⁶.

As the last point, biologic meshes may gain importance in the future because of their certain features. Biologic meshes are extremely expensive. They have been proposed as having advantage of using contaminated areas⁹⁷. The first prospective randomized study for a biologic mesh derived from porcine intestinal submucosa revealed promising results after Lichtenstein repair, while the number of subjects is quite small⁹⁸. Puccio et

Table 5: Possible indications for partially absorbable lightweight meshes in inguinal hernia repair.

<ul style="list-style-type: none"> • Small indirect hernia • Female patient • Inguinal hernia with severe pubic pain • Preperitoneal repair • Sportsman hernia • Patient preference • Patients concern about male infertility
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al. compared this biologic mesh with standard polypropylene and partially absorbable meshes in Lichtenstein repair and found similar outcomes for a short follow-up⁹⁹. Laparoscopic use of this mesh is also feasible, but series are not large yet to make a conclusion^{100,101}.

Today, standard polypropylene mesh still seems to be the choice for inguinal hernia repairs. Its use provides low recurrence and complication rates. Newer and more expensive lightweight meshes may be considered in certain situations as summarized in Table 5.

In conclusion, mesh repairs are superior to “non-mesh” tissue-suture repairs in repair of inguinal hernias. The advantages of the meshes well exceed their potential risk of complications. Lichtenstein repair and endoscopic/laparoscopic techniques have similar efficacy. Local anesthesia is a suitable and economic option for open repairs, and should be popularized in day-case setting. Prophylactic antibiotics can be used in centers with high rate of wound infection.

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