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Evidence-Based Clinical Practice Guidelines on the Management of Adult Inguinal Hernia: Primary Inguinal Hernia, Recurrent Inguinal Hernia and Bilateral Inguinal Hernia

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This information, based on the Philippine Society of General Surgeons (PSGS) Inc. Clinical Practice Guidelines, is intended to assist physicians and patients in the management of adult inguinal hernias. A distinct panel of experts together with the Technical Working Group (TWG) developed the PSGS Clinical Practice Guidelines. These guidelines are given by the PSGS based on the current scientific evidence and its views concerning accepted approaches to treatment of adult inguinal hernias.

These guidelines are not proposed to change, but to assist the proficiency and clinical judgment of physicians on the management of patients with adult inguinal hernia. Each patient's condition must be evaluated individually. It is important to discuss the guidelines and all information regarding treatment options with the patient. The choice of a well-informed patient plays a great role in the decision-making of the surgical procedure.

Executive Summary

The Philippine Society of General Surgeons (PSGS) Inc. together with the Philippine College of Surgeons (PCS) has published its Evidence-based Clinical Practice Guidelines (EBCPG) on other important general surgical conditions. From then on, numerous high quality clinical trials have been published on different general surgical problems. These publications have resulted in modifications in other clinical practice guidelines, like those in the United States and Europe.

In the Philippines, inguinal hernia repair is one of the most common surgical procedures performed by general surgeons and the number is expected to continue to rise in the future. The country's economic development and the rapid westernization of our lifestyles are major factors expected to contribute to the increased awareness of this condition.

The TWG put in order the clinical questions, search method, levels of evidence, and categories of recommendations. The TWG has been regularly monitoring the major sources of publications, namely, the Pubmed (Medline) of the U.S. National Library of Medicine and The Cochrane Library.

Level of Evidence

I. Evidence from at least one properly designed randomized controlled trial or meta-analysis.
II. Evidence from at least one well designed clinical trial without proper randomization, from prospective or cohort or case-control analytic studies (preferably from one center), from multiple time-series studies, or from dramatic results in uncontrolled experiments.
III. Evidence from opinions of respected authorities on the basis of clinical experiences, descriptive studies, or reports of expert committees.

Categories of Recommendation

Category A: At least 75% consensus by expert panel present

Category B: Recommendation was somewhat controversial and did not meet consensus

Category C: Recommendation caused real disagreements among panel

The TWG prepared the first draft of the manuscript which consisted of a summary of the strongest evidence associated with the clinical questions and suggested the recommendations. The first draft was discussed and modified by a Panel of Experts called together by the PSGS on August 3, 2005 at the Lubang Room of EDSA Shangrila Hotel. A second draft was completed by the TWG and this was discussed in a Public Forum on December 7, 2005 during the 63rd PCS Clinical Congress held at the Kamia Room of EDSA Shangrila Hotel. The PSGS Board of Directors then accepted the guidelines on February 11, 2006.

Summary of Recommendations:

1. The recommended treatment for inguinal hernia is mesh repair, either the laparoscopic or the open method. (Level 1A, Category A)

2. The recommended techniques for laparoscopic mesh repair are transabdominal preperitoneal (TAPP) or total extra preperitoneal (TePP) repair. (Level 1B, Category A)

3. It is not necessary to fix the mesh during laparoscopic TAPP or TEPP inguinal hernia repair. (Level 1B, Category A)

4. The recommended techniques for open mesh repair are the Lichtenstein, Plug and mesh and the Prolene Hernia System. (Level 1B, Category A)

5. The recommended treatment for recurrent inguinal hernia is mesh repair, either the laparoscopic or the open method. (Level 1A, Category A)

6. The recommended treatment for bilateral inguinal hernia is mesh repair, either the laparoscopic or the open method. (Level 1A, Category A)

7. Antimicrobial prophylaxis is not routinely recommended for elective groin hernia repair using mesh. (Level 1A, Category A)

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Acknowledgment

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Methods

The TWG used combined MESH terms and free text searches of databases from PubMed, Cochrane Library and the Philippine Journal of Surgical Specialties (PJSS) to retrieve titles. Only relevant titles were selected for full-text retrieval by nominal group technique and appraised by the group for eligibility of the retrieved studies. A total of 252 journal titles were retrieved, 13 full text titles were used for the guidelines. The Levels of Evidence used was based on the Oxford Centre for Evidence-Based Medicine Levels of Evidence, May 2001.

Outcome measures used in these Guidelines were hernia recurrence as the primary outcome and duration of operation (minutes), hematoma, seroma, wound/ superficial infection, serious complications (mesh/deep infection, vascular injury, visceral injury), length of postoperative hospital stay (days), time to return to normal activities, pain persisting at least > 3 months, and numbness at least > 3 months, as the secondary outcomes.

Operational Definitions

1. Persisting pain was defined as groin pain of any severity (including testicular) persisting at one year after the operation, or at the closest time point to one year provided this was at least three months after surgery.
2. Persisting numbness included paresthesia, dysesthesia and discomfort persisting at one year after the operation, or at the closest time point to one year provided this was at least three months after surgery.
3. Hernia recurrence data were based on the methods of ascertainment used in individual trials. Mean or median duration of follow-up ranged from 6 weeks to 36 months.
4. Adult-Age of participants greater or equal to 16 years. Subjects' ages ranged from 16-85 years (median of 52.3).
5. TAPP (transabdominal preperitoneal) – a laparoscopic hernia technique in which the peritoneal cavity is traversed and an incision is made over the peritoneum to expose the preperitoneal space over the inguinal area for mesh on lay placement. The peritoneum is then approximated (with staples or suturing) to cover the mesh prosthesis.
6. TEPP/TePP/TEP (totally extraperitoneal) – a laparoscopic approach wherein there is no penetration into the peritoneal cavity. The working space is preperitoneal and is created by inflating a balloon or by blunt dissection into the preperitoneal space to expose the inguinal area. The mesh is placed on lay into the preperitoneal space.
7. IPOM - intraperitoneal on lay mesh repair is a laparoscopic technique where a composite mesh is placed to cover the hernia defect without dissection of the preperitoneal space. The mesh is anchored to the abdominal cavity over the peritoneum.
8. Lichtenstein repair (LR)/open on-lay/open flat mesh - a mesh trimmed to fit the inguinal floor and secured by sutures.
9. Mesh plug repair (MPR)/plug and mesh – a two part mesh prosthesis, one as a plug (sutured) and one as flat mesh anterior to it (unsutured).
10. Prolene Hernia System (PHS) - circular mesh and a flat mesh that is connected by a tubular mesh acting as one unit where the flat portion is placed anterior, the tubular portion into the inguinal canal and the circular portion is placed posterior to the transversalis fascia or preperitoneally.

Results

1. What is the recommended treatment for inguinal hernia?

The recommended treatment for inguinal hernia is mesh repair, the laparoscopic or the open method. (Level 1 A, Category A)

McCormack K, Scott NW, Go PMNYH and Ross S (EU Hernia Trialists Collaboration) in 2003[1] reviewed laparoscopic techniques versus open techniques for inguinal hernia repair. This was published in the Cochrane Database of Systematic Reviews 2003. This is a meta-analysis of forty-one randomized control trials (RCTs) involving 7161 participants comparing laparoscopic techniques versus open techniques for inguinal hernia repair. The outcome shows the following: operation times for laparoscopic repair were longer, there was a higher risk of rare serious complications in laparoscopic repair, return to usual activities was faster in laparoscopic repair, less persisting pain and numbness in laparoscopic repair, hernia recurrence was less common in laparoscopic repair than open non–mesh repair but not different to open mesh methods and a reduced recurrence of around 30-50 percent was related to the use of mesh rather than the method of mesh placement.

Comparison of Clinical Outcomes of Laparoscopic versus Open Techniques for Inguinal Hernia Repair

Outcome	No. of Studies	No. of Participants	Statistical Method	Effect Size
Duration of operation (minutes)	37	6482	Weighted Mean Difference (Fixed) 95% CI	14.81 [13.98, 15 64]
Vascular injury	26	5256	Peto Odds Ratio 95% CI	1.38 [0.44,4.29]
Visceral injury	22	4914	Peto Odds Ratio 95% CI	5. 76 [1.53, 21.68]
Time to return to usual activities (days)	20	2608	Peto Odds Ratio 95% CI	0.56 [0.51, 0.61]
Persisting pain	21	4500	Peto Odds Ratio 95% CI	0.54 [0.46, 0.64]
Persisting numbness	16	3043	Peto Odds Ratio 95% CI	0.38 [0.29, 0.49]
Hernia recurrence	39	6642	Peto Odds Ratio 95% CI	0.81 [0.61, 1.08]

Source: Scott NW, McCormack K, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialists Collaboration. Laparoscopic techniques vs. open techniques for inguinal hernia repair. The Cochrane Database of Systematic Reviews, 2005, Issue 2

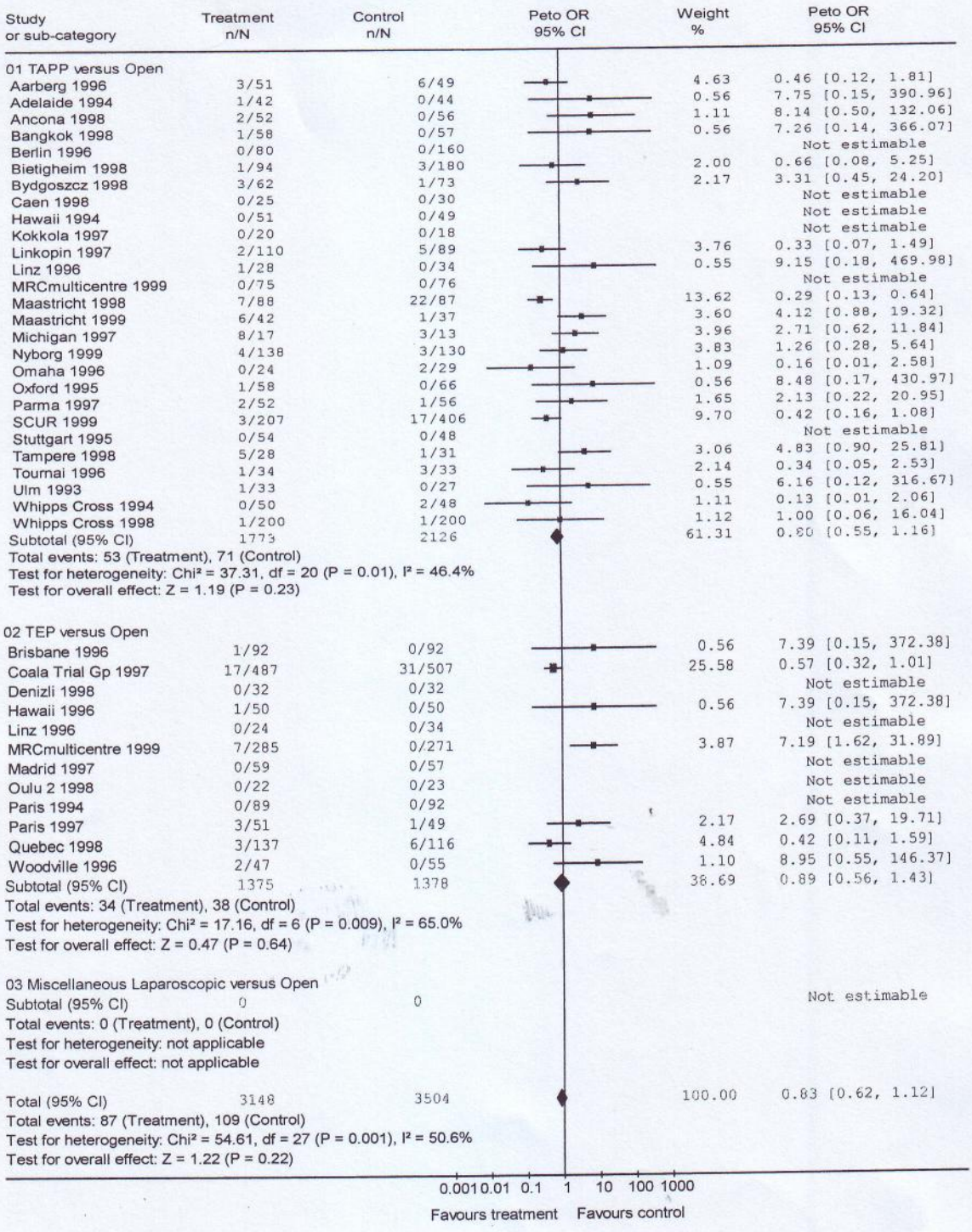
2. If laparoscopic mesh repair is the preferred technique for inguinal hernias, what is the recommended laparoscopic technique?

The recommended techniques for laparoscopic mesh repair are transabdominal preperitoneal (TAPP) or total extra preperitoneal (TePP). (Level 1B, Category A)

Schrenk P, Woisetschlaged R, Rieger R, and Wayan W[2] in November 1996 published in the British Journal of Surgery a prospective randomized trial comparing transabdominal preperitoneal, total preperitoneal or Shouldice technique for inguinal hernia repair on the rate of postoperative pain and return to physical activity. A total of 86 patients were randomized in the study, Shouldice (n=34), TAPP (n=28) or TPP (n=24). Results showed that there was no significant difference between the three groups for postoperative pain and return to physical activity.

Leopoldo Sarli, et al.[3] in December 1997 published in the Journal of Surgery Laparoscopy and Endoscopy a prospective comparison of TAPP and IPOM techniques, in laparoscopic hernia repair among 115 patients. Mean follow-up of patients was 32 months after the IPOM procedure and a mean follow-up of 28 months, after the

Hernia Recurrence Comparing Laparoscopic versus Open Techniques for Inguinal Hernia Repairs.



Source: Scott NW, McCormack K, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialists Collaboration. Laparoscopic techniques vs. open techniques for inguinal hernia repair. The Cochrane Database of Systematic Reviews, 2005, Issue 2

TAPP procedure. Results showed that neuralgias occurred in 3 TAPP and 11 cases of IPOM $p < 0.05$ and recurrences occurred in no cases of TAPP and in 8 cases of IPOM ($p \leq 0.01$).

3. Is fixation of the mesh necessary in laparoscopic repair?

It is not necessary to secure the mesh during laparoscopic TAPP or TEPP inguinal hernia repair. (Level 1 B, Category A)

Moreno-Egea, et al.[4] in December 2004 published in the Archives of Surgery a randomized clinical trial of fixation vs. nonfixation of mesh in total extraperitoneal inguinal hernioplasty. A total of 170 patients were assigned and followed-up for 36 ±12 months. Results showed that there were no significant differences with regard to operating time, morbidity or recurrences ($p < .001$).

Smith AI, et al.[5] in 1999 published in the Journal of Surgical Endoscopy a prospective randomized trial comparing stapled and nonstapled laparoscopic transabdominal preperitoneal (TAPP) inguinal hernia repair. A total of 502 patients were randomized: 263 were nonstapled and 273 were stapled repairs. Patients were followed-up for a median of 16 months. Results showed that there was no statistical difference in the incidence of recurrence: 0 in 263 nonstapled patients and 3 in 273 stapled patients chi-square ($p = 0.09$). Similarly, there was no significant difference in operative time, port-site hernia, chronic pain or neuralgia between the two groups.

4. If open mesh repair, what is the recommended technique?

The recommended technique for open mesh repair is the Lichtenstein, plug and mesh or Prolene Hernia System. (Level 1B, Category A)

Scott NW, McCormack, Graham P, Go PMNYH, Ross SJ, and Grant AM[6] on behalf of the EU Hernia Trialist Collaboration in 2005 published in The Cochrane Collaboration a review on open mesh versus non mesh repair for groin hernia. The aim of the review was to evaluate mesh techniques in the open surgical repair of groin hernias. The open flat mesh (Lichtenstein) repair was compared with plug and mesh (plug and patch) repair. Results showed that there was insufficient data to reliably address different types of open mesh repair, particularly flat mesh and plug and mesh repair but it seemed that there was no significant difference between the two techniques.

Comparison of Flat Mesh vs. Plug and Mesh.

Outcome Title	Number of Studies	No. of Participants	Statistical Method	Effect Size
Duration of operation (mins)	2	220	Weighted Mean Difference (Fixed) 95% CI	4.45 [1.65, 7.25]
Hematoma	2	221	Peto Odds Ratio 95% CI	1.04 [0.06, 16.58]
Seroma	2	221	Peto Odds Ratio 95% CI	1.00 [0.06, 16.27]
Wound/superficial infection	2	221	Peto Odds Ratio 95% CI	3.53 [0.60, 20.62]
Length of stay (days)	1	141	Weighted Mean Difference (Fixed) 95% CI	-0.07 [-0.21, 0.07]
Time to return to usual activities	2	214	Peto Odds Ratio 95% CI	1.09 [0.83,1.42]
Pain	0	0	Peto Odds Ratio 95% CI	Not estimable
Numbness	0	0	Peto Odds Ratio 95% CI	Not estimable
Recurrence	2	214	Peto Odds Ratio 95% CI	0.14 [0.01,1.32]

Source: Scott NW, McCormack K, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialists Collaboration. Laparoscopic techniques vs. open techniques for inguinal hernia repair. The Cochrane Database of Systematic Reviews, 2005, Issue 2

Niejhuijs SW, Van Oort I, Keemers-Gels ME, Strobbe LJA and Rosman C.[7] in January 2005 published in the British Journal of Surgery a randomized clinical trial comparing the Prolene Hernia System (PHS), mesh plug repair (MPR) and Lichtenstein method for open inguinal hernia repair. A total of 334 patients were allocated blindly, 111 to PHS, 113 to MPR and 110 to Lichtenstein. The aim was to compare the 3 techniques of open mesh repair. Short and long term results (2 weeks, 3 months and at 15 months postoperative follow up) were determined. Outcomes were postoperative pain and quality of life. Results showed that patients reported no difference in postoperative pain in the three types of hernia repair in the 1st 14 days and mean amount of paracetamol used per day was 1.9, 1.6 and 1.8 gm after PHS, MPR and Lichtenstein repair, respectively. In conclusion, there was no clinically significant difference in post operative pain and quality of life among the three types of mesh hernia repair.

5. What is the recommended treatment for recurrent inguinal hernia?

The recommended treatment for recurrent inguinal hernia is mesh repair, either laparoscopic or open method. (Level 1 A, Category A)

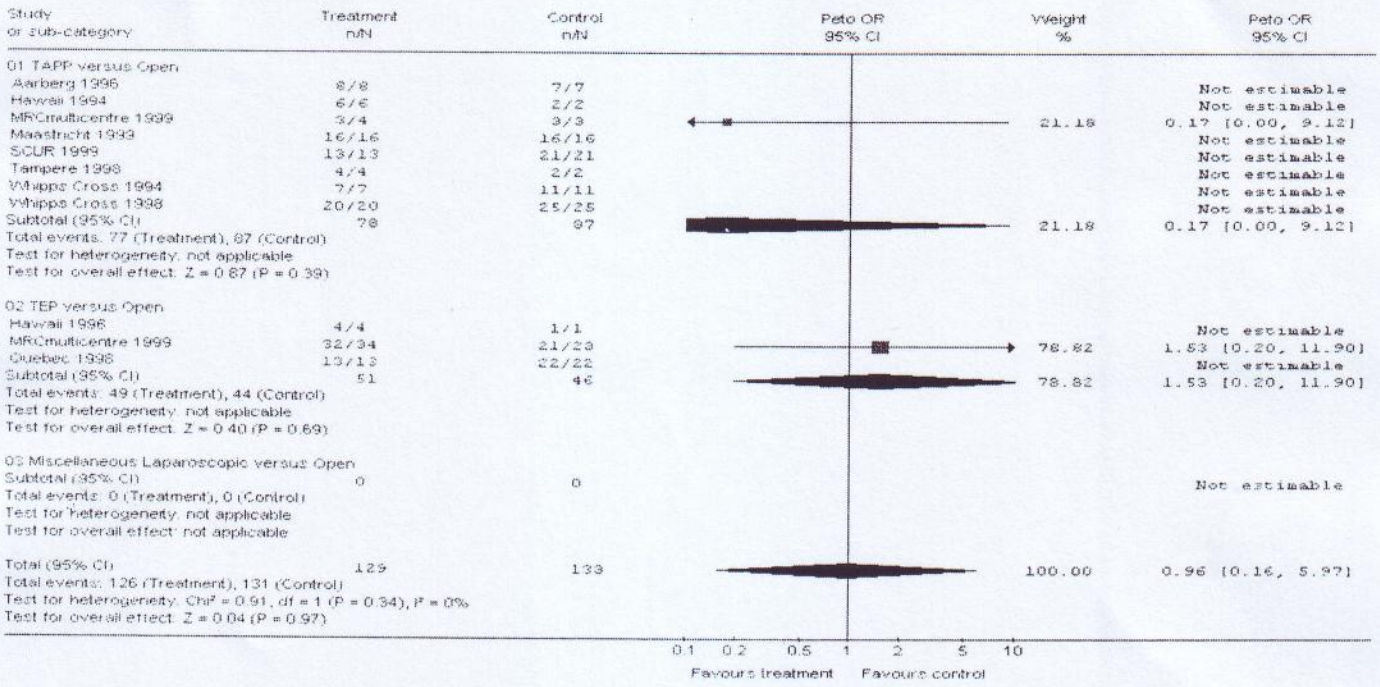
Mc Cormack K, Scott NW, Go PMNYH, Ross S, and Grant AM[1] on behalf of the EU Hernia Trialists Collaboration published in 2003 in The Cochrane Database of Systematic Reviews a study comparing laparoscopic repair versus open repair for recurrent hernias. Twelve RCTs were included and subgroup analysis on recurrent hernias was conducted. Results showed the following: duration of operation was significantly longer for laparoscopic approach but hematoma, visceral injury, persisting pain, persisting numbness, seroma, and wound/superficial infection, hernia recurrence were all comparable. Length of stay in the hospital was significantly shorter for laparoscopic approach and time to return to usual activities was significantly faster for laparoscopic approach.

Comparison of Laparoscopic vs. Open Repair for Recurrent Hernias.

Outcome Title	No. of Studies	No. of Participants	Statistical Method	Effect Size
Duration of the operation (minutes)	14	448	Weighted Mean Difference (Fixed) 95% CI	14.31 [10.77,17.85]
Hematoma	11	383	Peto Odds Ratio 95% CI	0.60 [0.34,1.06]
Seroma	11	379	Peto Odds Ratio 95% CI	1.39 [0.67,2.90]
Wound/superficial infection	11	383	Peto Odds Ratio 95% CI	0.50 [0.17,1.46]
Mesh/deep infection	9	358	Peto Odds Ratio 95% CI	0.22 [0.00,13.54]
Vascular injury	10	312	Peto Odds Ratio 95% CI	Not estimable
Visceral injury	9	306	Peto Odds Ratio 95% CI	5.47 [0.10,293.68]
Length of stay (days)	12	367	Weighted Mean Difference (Fixed) 95% CI	0.01 [-0.13,0.15]
Time to return to usual activities (days)	11	262	Peto Odds Ratio 95% CI	0.60 [0.46,0.78]
Persisting pain	9	331	Peto Odds Ration 95% CI	0.90 [0.50,1.59]
Persisting numbness	9	332	Peto Odds Ratio 95% CI	0.79 [0.39,1.61]
Hernia recurrence	12	387	Peto odds Ratio 95% CI	1.04 [0.45,2.43]

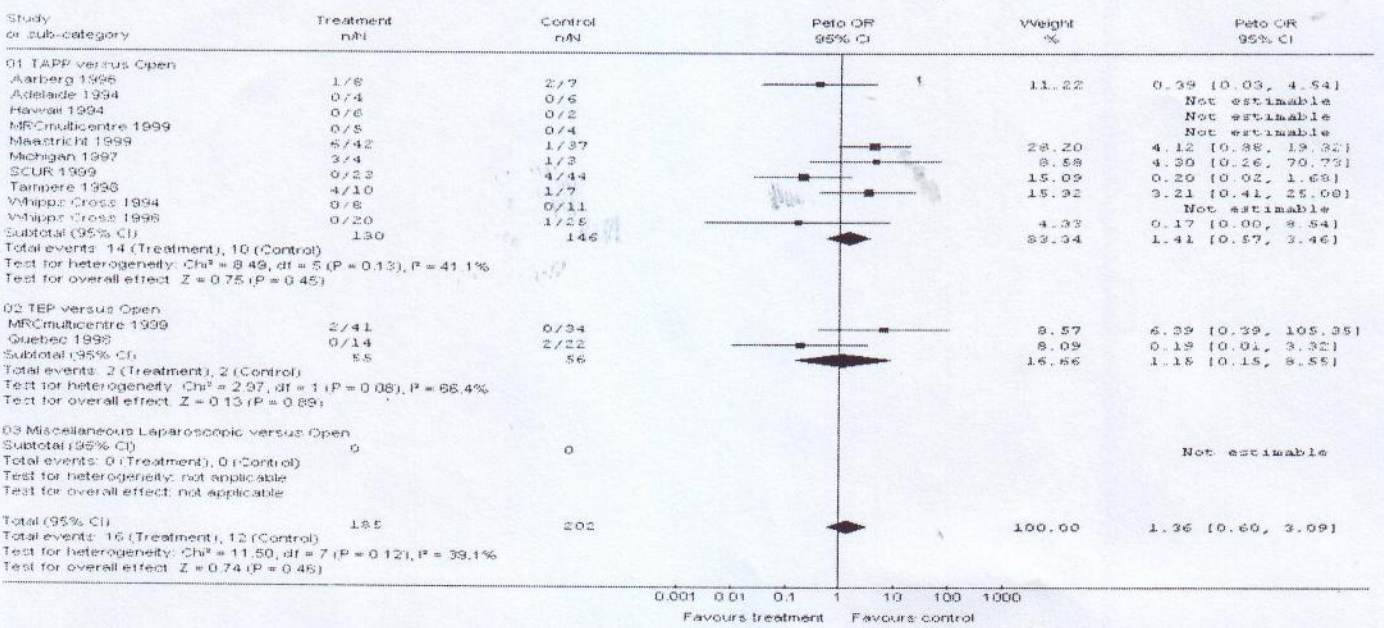
Source: McCormack K, Scott NW, Go PMNYH, Ross S (EU Hernia Trialists Collaboration) The Cochrane Database of Systematic Reviews 2003, Laparoscopic techniques versus open techniques for inguinal hernia repair (Review)

Comparison of Laparoscopic vs. Open Repair for Recurrent Hernias and Time to Return to Usual Activities (days).



Source: McCormack K, Scott NW, Go PMNYH, Ross S (EU Hernia Trialists Collaboration) The Cochrane Database of Systematic Reviews 2003, Laparoscopic techniques versus open techniques for inguinal hernia repair (Review).

Comparison of Laparoscopic Techniques vs. Open Techniques in Recurrent Inguinal Hernia Repair and Recurrence.



Source: McCormack K, Scott NW, Go PMNYH, Ross S (EU Hernia Trialists Collaboration) The Cochrane Database of Systematic Reviews 2003, Laparoscopic techniques versus open techniques for inguinal hernia repair (Review)

6. What is the recommended treatment for bilateral inguinal hernia?

The recommended treatment for bilateral inguinal hernia is mesh repair, either laparoscopic or open. (Level 1, Category A)

Scott NW, McCormack K, Graham P, Go PMNYH, Ross SJ, and Grant AM[8] on behalf of the EU Hernia Trialists Collaboration published in 2005 a study on laparoscopic techniques vs. open techniques for inguinal hernia repair. Twelve RCTs were included and subgroup analysis of bilateral hernias was done. No significant differences in recurrence rate, incidence of hematoma, seroma, length of hospital stay, persisting pain and numbness between laparoscopic and open mesh procedures were found. Laparoscopic mesh procedures had a longer duration of operation, and seemed to have a higher incidence of visceral injury. Likewise, laparoscopic mesh procedures had slightly less wound/ superficial infection and shorter time to return to usual activities.

Mahon D, Decadt B and Rhodes M[9] in 2003 published in the Journal of Surgical Endoscopy a prospective randomized trial of laparoscopic (transabdominal preperitoneal) vs open (mesh) repair for bilateral and recurrent inguinal hernia. A total of 120 patients with bilateral or recurrent hernias, 42 recurrent and 70 bilateral. Seven were both bilateral and recurrent. Primary outcome was postoperative pain and the secondary outcomes: well-being, post-op mobilization, return to work, recurrence rate, chronic pain and complications. Results showed that there was no difference in terms of recurrence, incidence of hematoma and other complications.

Comparison of Laparoscopic Techniques vs. Open Mesh Techniques in Bilateral Inguinal Hernia Repair and Hernia Recurrence.

	(+) Recurrence	(-) Recurrence
Laparoscopic	4	55
Open	1	59

$p = 0.351$ NS

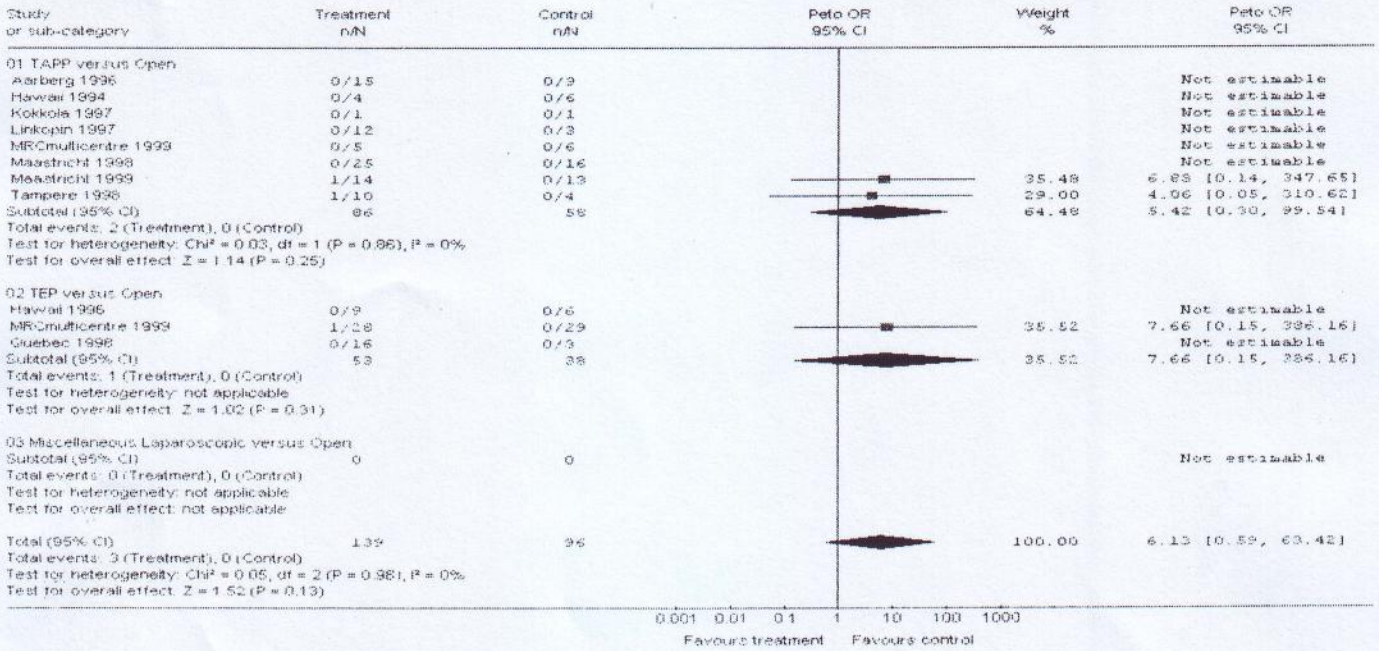
	Estimate	95%CI
RRI	3.068	-0.532, 34.332
ARI	0.051	-0.021 to 0.123
NNH	20.000	8 to 48

Comparison of Laparoscopic vs. Open (Bilateral Hernias).

Outcome title	No. of Studies	No. of Participants	Statistical Method	Effect Size
Duration of the operation (minutes)	4	168	Weighted Mean Difference (Fixed) 95% CI	12.12 [7.98,16.26]
Hematoma	11	266	Peto Odds Ratio 95% CI	1.38 [0.67,2.83]
Seroma	10	250	Peto Odds Ratio 95% CI	1.24 [0.56,2.75]
Wound/superficial infection	11	265	Peto Odds Ratio 95% CI	0.27 [0.10,0.75]
Vascular injury	8	185	Peto Odds Ratio 95% CI	Not estimable
Visceral injury	9	232	Peto Odds Ratio 95% CI	5.16 [0.09,286.57]
Length of stay (days)	13	292	Weighted Mean Difference (Fixed) 95% CI	-0.09 [0.19,0.01]
Time to return to usual activities (days)	11	217	Peto Odds Ratio 95% CI	0.59 [0.44,0.79]
Persisting pain	7	223	Peto Odds Ration 95% CI	0.70 [0.38,1.30]
Persisting numbness	8	228	Peto Odds Ratio 95% CI	0.56 [0.24,1.31]0
Hernia recurrence	12	227	Peto odds Ratio 95% CI	1.36 [0.55,3.37]

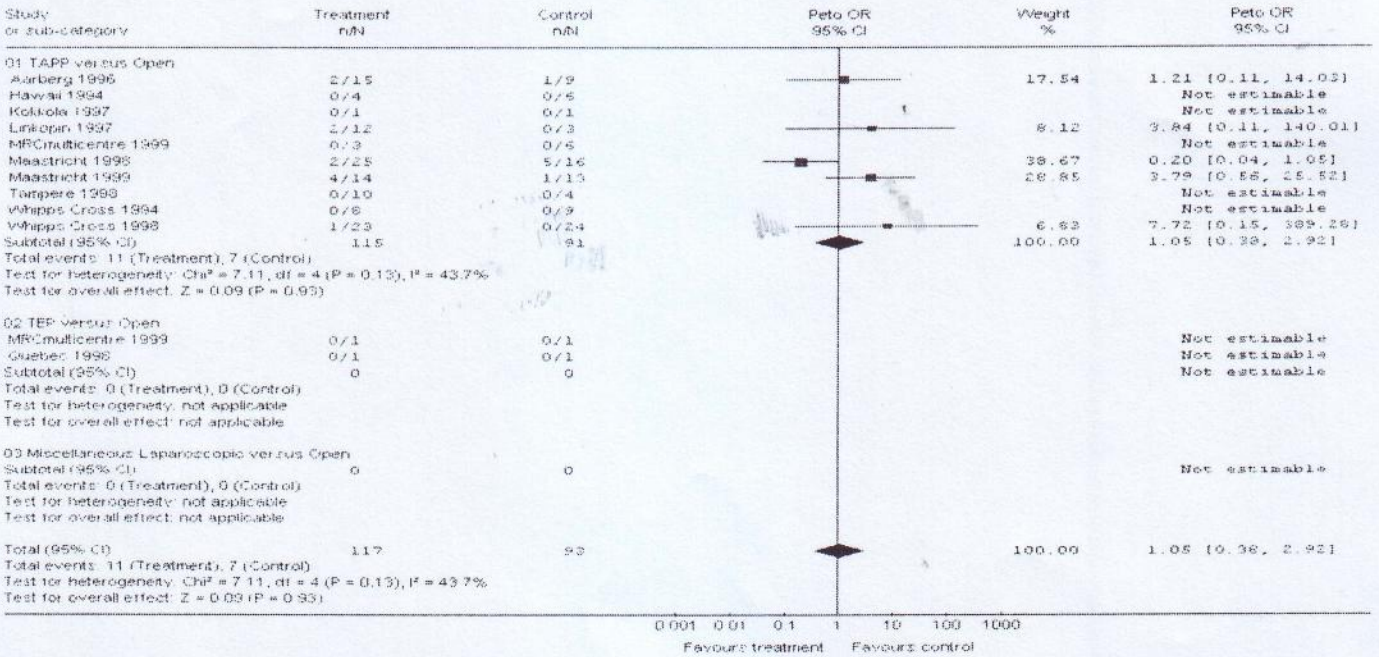
Source: Scott NW, McCormack, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialist Collaboration Open mesh versus non mesh for groin hernia repair (Review) The Cochrane Collaboration The Cochrane Library 2005, Issue 2

Comparison of Laparoscopic Techniques vs. Open Techniques in Bilateral Inguinal Hernia Repair.



Source: Scott NW, McCormack, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialist Collaboration Open mesh versus non mesh for groin hernia repair (Review) The Cochrane Collaboration The Cochrane Library 2005, Issue 2.

Comparison of Laparoscopic Techniques vs. Open Techniques in Bilateral Inguinal Hernia Repair and Hernia Recurrence.



Source: Scott NW, McCormack, Graham P, Go PMNYH, Ross SJ, Grant AM on behalf of the EU Hernia Trialist Collaboration Open mesh versus non mesh for groin hernia repair (Review) The Cochrane Collaboration The Cochrane Library 2005, Issue 2

Sarli L, Iusco DR, Sansebastiano G, Costi R[4] in 2001 published in the Journal of Surgery Laparoscopy and Endoscopy a prospective randomized study of open tension-free versus laparoscopic approach in the repair of bilateral inguinal hernias. A total of 43 low risk patients were randomized with a blind envelope system, single surgeon with adequate experience in laparoscopic preperitoneal "bikini mesh" (TAPP) vs. open Lichtenstein hernioplasty. There was no difference in operating time, 95 +/- 32.3 min vs. 99 +/- 28.3 min, no intraoperative complications for both, the intensity of postoperative pain was greater in the open group at 24 hours, 48 hours and 7 days after surgery ($p = 0.001$) with a greater consumption of pain medication among these patients ($p<0.05$). Only 1 asymptomatic recurrence (4.3%) was discovered in the open group.

Median (25^{th}-75^{th} percentile) Visual Analog Scale for Pain for Laparoscopic vs Open Herniorrhaphy.

Time point	Laparoscopic (n=20)	Open (n=23)	*p*
Preoperative	1 (1-2)	1 (1-2)	*ns**
6 hrs post-op	3 (2-5)	4 (2-6)	*ns**
12 hrs	3 (2-4)	4 (2-6)	*ns**
24 hrs	1 (1-3)	4 (2-6)	0.001
48 hrs	1 (1-3)	3 (2-5)	0.001

*ns** not significant

Source: Sarli L, Iusco DR, Sansebastiano G, Costi R. Simultaneous Repair of Bilateral Inguinal Hernias: A Prospective, Randomized Study of Open, Tension-Free versus Laparoscopic Approach. Surg Laparosc Endosc Percutan Tech 2001. 11(4): 262-267.

7. Is antimicrobial prophylaxis recommended for elective groin hernia surgery?

Antimicrobial prophylaxis is not routinely recommended for elective groin hernia surgery using mesh. (Level I A, Category A)

Aufenacker TJ, Koelemay MJW, Gouma DJ and Simons MP[10] in 2005 published in the British Journal of Surgery a systematic review and meta-analysis of the effectiveness of antibiotic prophylaxis in prevention of wound infection after mesh repair of abdominal wall hernia. The aim was to determine whether systemic antibiotic prophylaxis prevented wound infection after repair of abdominal wall hernia with mesh. The incidence of infection after groin hernia repair was 38 (3.0 %) of 1277 in the placebo group and 18 (1.5 %) of 1230 in the antibiotic group. Antibiotic prophylaxis did not significantly reduce the incidence of infection: odds ratio 0.54 (95 % CI 0.24 to 1.21); number needed to treat was 74. The number of deep infections was six (0.6 %) in the placebo group and three (0.3 %) in the antibiotic prophylaxis group: odds ratio 0.50 (95 % CI 0.12 to 2.09). Antibiotic prophylaxis did not prevent the occurrence of wound infection after groin hernia surgery.

Comparisons of Prophylactic Antibiotic vs. Placebo in Mesh Repairs in Abdominal Wall Hernia Repair and Wound Infection.

	Prophylaxis	Placebo	OR (95% CI)
Superficial infection	18/1230	38/1277	0.54 (0.24, 1.21)
Deep infections	3/1230	7/1277	0.50 (0.12, 2.09)

NNT = 74

Source: Aufenacker, T. J, Koelemay, M.J.W, Gouma, D.J, and Simons, M.P. Systematic review and meta-analysis of the effectiveness of antibiotic prophylaxis in prevention of wound infection after mesh repair of abdominal wall hernia. Br J Surg 2005; 93: 5-10

Sanchez-Manuel FJ and Seco-Gil JL[11] in 2004 reviewed antibiotic prophylaxis for hernia repair. This was published in the Cochrane Database of Systematic Reviews in June 2004. The objective of this systematic review was to clarify the effectiveness of antibiotic prophylaxis in reducing postoperative wound infection rates in elective open inguinal hernia repair. Eight randomized clinical trials were identified. Three of them used prosthetic material for hernia repair (hernioplasty) whereas the remaining studies did not (herniorraphy). Pooled and subgroup analysis were conducted depending on whether prosthetic material was used or not. The total number of patients included was 2907 (treatment group: 1421, control group: 1486). Overall infection rates were 2.88 percent and 4.3 percent in the prophylaxis and control groups, respectively

(OR 0.65, 95%CI 0.35 - 1.21). (The subgroup of patients with herniorrhaphy had infection rates of 3.78 percent and 4.87 percent in the prophylaxis and control groups, respectively (OR 0.84, 95%CI 0.53 - 1.34). The subgroup of patients with hernioplasty had infection rates of 1.2 percent and 3.3 percent in the prophylaxis and control groups, respectively (OR 0.28, 95%CI 0.02 - 3.14). Based on the results of this meta-analysis, there was no clear evidence that routine administration of antibiotic prophylaxis for elective inguinal hernia repair reduced infection rates.

Comparisons of Prophylactic Antibiotic vs. Placebo in Open Inguinal Hernia Repair and Wound Infection.

	Prophylaxis (%)	Control (%)	OR (95% CI)
Overall infection rate	41/1421 (2.88)	64/1486 (4.3)	0.65 (0.35, 1.21)
Herniorrhaphy	35/924 (3.78)	46/943 (4.87)	0.84 (0.53, 1.34)
Hernioplasty	5/373 (1.2)	18/420 (3.3)	0.28 (0.02, 3.14)

Source: Sanchez-Manuel FJ and Seco-Gil JL. Antibiotic Prophylaxis for hernia repair (Review) The Cochrane Collaboration The Cochrane Library 2004, Issue 1

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