

# Desarda's technique versus Lichtenstein technique for the treatment of primary inguinal hernia: a systematic review and meta-analysis of randomized controlled trials

Hernia

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Review

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## Abstract

### Purpose

The Lichtenstein technique (LT) has been recognized as the standard treatment for inguinal hernia in adults owing to the high recurrence rates of tissue-based repairs. However, Desarda technique (DT) appeared as promising tissue-based repair that provided low incidence of recurrence without the need for implanting prosthetic or foreign materials in the inguinal canal. This meta-analysis of randomized controlled trials (RCTs) comparing DT and LT for primary inguinal hernia in adults aimed to determine which technique had better clinical outcome regarding recurrence and complication rates.

### Methods

A systematic literature search for RCTs comparing between DT and LT was conducted using electronic databases and Google scholar service. Patients' characteristics, technical details, recurrence and complication rates, and time to resume daily activities were extracted from the original studies and analyzed.

## Results

Six RCTs comprising 2159 patients (89% males) were included. No significant difference in the incidence of recurrence between both techniques was detected (OR = 0.946;  $P = 0.91$ ). The overall complication rate of LT was significantly higher than DT (OR = 1.86;  $P < 0.001$ ). LT had significantly higher rates of seroma formation and surgical site infection (OR = 2.17;  $P = 0.007$ ) and (OR = 2.17;  $P = 0.029$ ), respectively. Postoperative pain, operation time, and time to resume normal activities were comparable in both groups.

## Conclusion

Both DT and LT provided satisfactory treatment for primary inguinal hernia with low recurrence rates and acceptable rates of complications that were significantly less after DT. More well-designed RCTs with longer follow-up are required for further validation of the DT.

## Keywords

Desarda Lichtenstein Inguinal hernia Randomized controlled trial Review  
Meta-analysis

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## Notes

### Author contribution

Sameh Emile designed the study, shared in acquisition and analysis of data, and drafted the manuscript. Hossam Elfeki shared in acquisition and analysis of data, drafting and critical revision of the manuscript. Both authors approved the final version of the manuscript.

## Compliance with ethical standards

### Conflict of interest

No conflict of interest to be declared by the authors.

### Ethical approval

This article did not require ethical approval of any kind.

### Human and animal rights

This article does not contain any studies with human participants or animals performed by any of the authors.

### Informed consent

This article does not include patients, and therefore informed consent was not applicable.

## References

1. Awad SS, Fagan SP (2004) Current approaches to inguinal hernia repair. *Am J Surg* 188(6A Suppl):9S–16S  
[CrossRef](https://doi.org/10.1016/j.amjsurg.2004.09.007) (https://doi.org/10.1016/j.amjsurg.2004.09.007)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=15610887) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=15610887)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Current%20approaches%20to%20inguinal%20hernia%20repair&author=SS.%20Awad&author=SP.%20Fagan&journal=Am%20J%20Surg&volume=188&issue=6A%20Suppl&pages=9S-16S&publication_year=2004) (http://scholar.google.com/scholar\_lookup?title=Current%20approaches%20to%20inguinal%20hernia%20repair&author=SS.%20Awad&author=SP.%20Fagan&journal=Am%20J%20Surg&volume=188&issue=6A%20Suppl&pages=9S-16S&publication\_year=2004)
2. Primatesta P, Goldacre MJ (1996) Inguinal hernia repair: incidence of elective and emergency surgery, readmission and mortality. *Int J Epidemiol* 25:835–839  
[CrossRef](https://doi.org/10.1093/ije/25.4.835) (https://doi.org/10.1093/ije/25.4.835)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=8921464) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=8921464)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Inguinal%20hernia%20repair%3A%20incidence%20of%20elective%20and%20emergency%20surgery%2C%20readmission%20and%20mortality&author=P.%20Primatesta&author=MJ.%20Goldacre&journal=Int%20J%20Epidemiol&volume=25&pages=835-839&publication_year=1996) (http://scholar.google.com/scholar\_lookup?title=Inguinal%20hernia%20repair%3A%20incidence%20of%20elective%20and%20emergency%20surgery%2C%20readmission%20and%20mortality&author=P.%20Primatesta&author=MJ.%20Goldacre&journal=Int%20J%20Epidemiol&volume=25&pages=835-839&publication\_year=1996)
3. Scott NW, McCormack K, Graham P, Go PM, Ross SJ, Grant AM (2002) Open mesh versus non-mesh for repair of femoral and inguinal hernia. *Cochrane Database Syst Rev* (4):CD002197

**Google Scholar** (<https://scholar.google.com/scholar?q=Scott%20NW%2C%20McCormack%20K%2C%20Graham%20P%2C%20Go%20PM%2C%20Ross%20SJ%2C%20Grant%20AM%20%282002%29%20Open%20mesh%20versus%20non-mesh%20for%20repair%20of%20femoral%20and%20inguinal%20hernia.%20Cochrane%20Database%20Syst%20Rev%20%284%29%3ACD002197>)

4. **Simons MP, Aufenacker T, Bay-Nielsen M et al (2009) European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. *Hernia* 13:343–403**  
**CrossRef** (<https://doi.org/10.1007/s10029-009-0529-7>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=19636493](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=19636493))  
**PubMedCentral** (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719730>)  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=European%20Hernia%20Society%20guidelines%20on%20the%20treatment%20of%20inguinal%20hernia%20in%20adult%20patients&author=MP.%20Simons&author=T.%20Aufenacker&author=M.%20Bay-Nielsen&journal=Hernia&volume=13&pages=343-403&publication\\_year=2009](http://scholar.google.com/scholar_lookup?title=European%20Hernia%20Society%20guidelines%20on%20the%20treatment%20of%20inguinal%20hernia%20in%20adult%20patients&author=MP.%20Simons&author=T.%20Aufenacker&author=M.%20Bay-Nielsen&journal=Hernia&volume=13&pages=343-403&publication_year=2009))
5. **Lichtenstein IL, Shulman AG, Amid PK et al (1989) The tension free hernioplasty. *Am J Surg* 157:88–193**  
**CrossRef** ([https://doi.org/10.1016/0002-9610\(89\)90526-6](https://doi.org/10.1016/0002-9610(89)90526-6))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=The%20tension%20free%20hernioplasty&author=IL.%20Lichtenstein&author=AG.%20Shulman&author=PK.%20Amid&journal=Am%20J%20Surg&volume=157&pages=88-193&publication\\_year=1989](http://scholar.google.com/scholar_lookup?title=The%20tension%20free%20hernioplasty&author=IL.%20Lichtenstein&author=AG.%20Shulman&author=PK.%20Amid&journal=Am%20J%20Surg&volume=157&pages=88-193&publication_year=1989))
6. **Amid PK, Shulman AG, Lichtenstein IL (1996) Open “tension free” repair of inguinal hernias: the Lichtenstein technique. *Eur J Surg* 162:447–453**  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=8817221](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=8817221))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Open%20%E2%80%98%E2%80%98tension%20free%E2%80%99%E2%80%99%20repair%20of%20inguinal%20hernias%3A%20the%20Lichtenstein%20technique&author=PK.%20Amid&author=AG.%20Shulman&author=IL.%20Lichtenstein&journal=Eur%20J%20Surg&volume=162&pages=447-453&publication\\_year=1996](http://scholar.google.com/scholar_lookup?title=Open%20%E2%80%98%E2%80%98tension%20free%E2%80%99%E2%80%99%20repair%20of%20inguinal%20hernias%3A%20the%20Lichtenstein%20technique&author=PK.%20Amid&author=AG.%20Shulman&author=IL.%20Lichtenstein&journal=Eur%20J%20Surg&volume=162&pages=447-453&publication_year=1996))
7. **Robert E (2001) Condon, groin pain after hernia repair. *Ann Surg* 233(1):8**  
**CrossRef** (<https://doi.org/10.1097/00000658-200101000-00002>)  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Condon%2C%20groin%20pain%20after%20hernia%20repair&author=E.%20Robert&journal=Ann%20Surg&volume=233&issue=1&pages=8&publication\\_year=2001](http://scholar.google.com/scholar_lookup?title=Condon%2C%20groin%20pain%20after%20hernia%20repair&author=E.%20Robert&journal=Ann%20Surg&volume=233&issue=1&pages=8&publication_year=2001))
8. **D'Amore L, Gossetti F, Vermeil V et al (2008) Long-term discomfort after plug and patch hernioplasty. *Hernia* 12:445–446**  
**CrossRef** (<https://doi.org/10.1007/s10029-008-0349-1>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=18270787](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=18270787))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Long-term%20discomfort%20after%20plug%20and%20patch%20hernioplasty&author](http://scholar.google.com/scholar_lookup?title=Long-term%20discomfort%20after%20plug%20and%20patch%20hernioplasty&author)

=L.%20D%E2%80%99Amore&author=F.%20Gossetti&author=V.%20Vermeil&journal=Hernia&volume=12&pages=445-446&publication\_year=2008)

9. Hamy A, Paineau J, Savigny JL et al (1997) Sigmoid perforation, an exceptional late complication of peritoneal prosthesis for treatment of inguinal hernia. *Int Surg* 82:307–308  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=9372380](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=9372380))  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Sigmoid%20perforation%2C%20an%20exceptional%20late%20complication%20of%20peritoneal%20prosthesis%20for%20treatment%20of%20inguinal%20hernia&author=A.%20Hamy&author=J.%20Paineau&author=JL.%20Savigny&journal=Int%20Surg&volume=82&pages=307-308&publication\\_year=1997](http://scholar.google.com/scholar_lookup?title=Sigmoid%20perforation%2C%20an%20exceptional%20late%20complication%20of%20peritoneal%20prosthesis%20for%20treatment%20of%20inguinal%20hernia&author=A.%20Hamy&author=J.%20Paineau&author=JL.%20Savigny&journal=Int%20Surg&volume=82&pages=307-308&publication_year=1997))
10. Sakorafas GH, Halikias I, Nissotakis C et al (2001) Open tension free repair of inguinal hernias; the Lichtenstein technique. *BMC Surg* 1:3  
CrossRef (<https://doi.org/10.1186/1471-2482-1-3>)  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=11696246](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=11696246))  
PubMedCentral (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC59657>)  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Open%20tension%20free%20repair%20of%20inguinal%20hernias%3B%20the%20Lichtenstein%20technique&author=GH.%20Sakorafas&author=I.%20Halikias&author=C.%20Nissotakis&journal=BMC%20Surg&volume=1&pages=3&publication\\_year=2001](http://scholar.google.com/scholar_lookup?title=Open%20tension%20free%20repair%20of%20inguinal%20hernias%3B%20the%20Lichtenstein%20technique&author=GH.%20Sakorafas&author=I.%20Halikias&author=C.%20Nissotakis&journal=BMC%20Surg&volume=1&pages=3&publication_year=2001))
11. Amato B, Moja L, Panico S, Persico G, Rispoli C, Rocco N, Moschetti I (2009) Shouldice technique versus other open techniques for inguinal hernia repair. *Cochrane Database Syst Rev* 7(4):CD001543.  
doi: [10.1002/14651858.CD001543.pub3](https://doi.org/10.1002/14651858.CD001543.pub3)  
(<https://doi.org/10.1002/14651858.CD001543.pub3>)  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Shouldice%20technique%20versus%20other%20open%20techniques%20for%20inguinal%20hernia%20repair&author=B.%20Amato&author=L.%20Moja&author=S.%20Panico&author=G.%20Persico&author=C.%20Rispoli&author=N.%20Rocco&author=I.%20Moschetti&journal=Cochrane%20Database%20Syst%20Rev&volume=7&issue=4&pages=CD001543&publication\\_year=2009&doi=10.1002/14651858.CD001543.pub3](http://scholar.google.com/scholar_lookup?title=Shouldice%20technique%20versus%20other%20open%20techniques%20for%20inguinal%20hernia%20repair&author=B.%20Amato&author=L.%20Moja&author=S.%20Panico&author=G.%20Persico&author=C.%20Rispoli&author=N.%20Rocco&author=I.%20Moschetti&journal=Cochrane%20Database%20Syst%20Rev&volume=7&issue=4&pages=CD001543&publication_year=2009&doi=10.1002/14651858.CD001543.pub3))
12. Desarda MP (2001) New method of inguinal hernia: a new solution. *ANZ J Surg* 71:241–244  
CrossRef (<https://doi.org/10.1046/j.1440-1622.2001.02092.x>)  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=11355734](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=11355734))  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=New%20method%20of%20inguinal%20hernia%3A%20a%20new%20solution&author=MP.%20Desarda&journal=ANZ%20J%20Surg&volume=71&pages=241-244&publication\\_year=2001](http://scholar.google.com/scholar_lookup?title=New%20method%20of%20inguinal%20hernia%3A%20a%20new%20solution&author=MP.%20Desarda&journal=ANZ%20J%20Surg&volume=71&pages=241-244&publication_year=2001))
13. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D (2009) The PRISMA statement for reporting systematic reviews and metaanalyses of studies. *BMJ* 21(339):b2700

[CrossRef](https://doi.org/10.1136/bmj.b2700) (https://doi.org/10.1136/bmj.b2700)

[Google Scholar](http://scholar.google.com/scholar_lookup?title=The%20PRISMA%20statement%20for%20reporting%20systematic%20reviews%20and%20metaanalyses%20of%20studies%20that%20evaluate%20healthcareinterventions%3A%20explanation%20and%20elaboration&author=A.%20Liberati&author=DG.%20Altman&author=J.%20Tetzlaff&author=C.%20Mulrow&author=PC.%20G%3B8tzsche&author=JP.%20Ioannidis&author=M.%20Clarke&author=PJ.%20Devereaux&author=J.%20Kleijnen&author=D.%20Moher&journal=BMJ&volume=21&issue=339&pages=b2700&publication_year=2009) (http://scholar.google.com/scholar\_lookup?

title=The%20PRISMA%20statement%20for%20reporting%20systematic%20reviews%20and%20metaanalyses%20of%20studies%20that%20evaluate%20healthcareinterventions%3A%20explanation%20and%20elaboration&author=A.%20Liberati&author=DG.%20Altman&author=J.%20Tetzlaff&author=C.%20Mulrow&author=PC.%20G%3B8tzsche&author=JP.%20Ioannidis&author=M.%20Clarke&author=PJ.%20Devereaux&author=J.%20Kleijnen&author=D.%20Moher&journal=BMJ&volume=21&issue=339&pages=b2700&publication\_year=2009)

14. Manyilira W, Kijjambu S, Upoki A, Kiryabwire J (2012) Comparison of non-mesh (Desarda) and mesh (Lichtenstein) methods for inguinal hernia repair among black African patients: a short-term double-blind RCT. *Hernia* 16(2):133–144

**Epub 2011 Oct 8**

[CrossRef](https://doi.org/10.1007/s10029-011-0883-0) (https://doi.org/10.1007/s10029-011-0883-0)

[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=21983842) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?

cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=21983842)

[Google Scholar](http://scholar.google.com/scholar_lookup?title=Comparison%20of%20non-mesh%20Desarda%20and%20mesh%20Lichtenstein%20methods%20for%20inguinal%20hernia%20repair%20among%20black%20African%20patients%3A%20a%20short-term%20double-blind%20RCT&author=W.%20Manyilira&author=S.%20Kijjambu&author=A.%20Upoki&author=J.%20Kiryabwire&journal=Hernia&volume=16&issue=2&pages=133-144&publication_year=2012) (http://scholar.google.com/scholar\_lookup?

title=Comparison%20of%20non-

mesh%20Desarda%20and%20mesh%20Lichtenstein%20methods%20for%20inguinal%20hernia%20repair%20among%20black%20African%20patients%3A%20a%20short-term%20double-blind%20RCT&author=W.%20Manyilira&author=S.%20Kijjambu&author=A.%20Upoki&author=J.%20Kiryabwire&journal=Hernia&volume=16&issue=2&pages=133-144&publication\_year=2012)

15. Szopinski J, Dabrowiecki S, Pierscinski S, Jackowski M, Jaworski M, Szuflet Z (2012) Desarda versus Lichtenstein technique for primary inguinal hernia treatment: 3-year results of a randomized clinical trial. *World J Surg* 36(5):984–992

[CrossRef](https://doi.org/10.1007/s00268-012-1508-1) (https://doi.org/10.1007/s00268-012-1508-1)

[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=22392354) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?

cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=22392354)

[PubMedCentral](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3321139) (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3321139)

[Google Scholar](http://scholar.google.com/scholar_lookup?title=Desarda%20versus%20Lichtenstein%20technique%20for%20primary%20inguinal%20hernia%20treatment%3A%203-year%20results%20of%20a%20randomized%20clinical%20trial&author=J.%20Szopinski&author=S.%20Dabrowiecki&author=S.%20Pierscinski&author=M.%20Jackowski&author=M.%20Jaworski&author=Z.%20Szuflet&journal=World%20J%20Surg&volume=36&issue=5&pages=984-992&publication_year=2012) (http://scholar.google.com/scholar\_lookup?

title=Desarda%20versus%20Lichtenstein%20technique%20for%20primary%20inguinal%20hernia%20treatment%3A%203-

year%20results%20of%20a%20randomized%20clinical%20trial&author=J.%20Szopinski&author=S.%20Dabrowiecki&author=S.%20Pierscinski&author=M.%20Jackowski&author=M.%20Jaworski&author=Z.%20Szuflet&journal=World%20J%20Surg&volume=36&issue=5&pages=984-992&publication\_year=2012)

16. Rodríguez P, Herrera P, Gonzalez O, Alonso J, Blanco H (2013) A randomized trial comparing lichtenstein repair and no mesh desarda repair for inguinal hernia: a study of 1382 patients. *East Central Afr J Surg* 18(2):18–25

[Google Scholar](http://scholar.google.com/scholar_lookup?title=A%20randomized%20trial%20comparing%20lichtenstein%20repair%20and%20no%20mesh%20desarda%20repair%20for%20inguinal%20hernia%3A%20a%20study%20of%201382%20patients&author=P.%20Rodr%C3%ADguez&author=P.%20Herrera&author=O.%20Gonzalez&author=J.%20Alonso&author=H.%20) (http://scholar.google.com/scholar\_lookup?

title=A%20randomized%20trial%20comparing%20lichtenstein%20repair%20and%20no%20mesh%20desarda%20repair%20for%20inguinal%20hernia%3A%20a%20study%20of%201382%20patients&author=P.%20Rodr%C3%ADguez&author=P.%20Herrera&author=O.%20Gonzalez&author=J.%20Alonso&author=H.%20

Blanco&journal=East%20Central%20Afr%20J%20Surg&volume=18&issue=2&pages=18-25&publication\_year=2013)

17. Youssef T, El-Alfy K, Farid M (2015) Randomized clinical trial of Desarda versus Lichtenstein repair for treatment of primary inguinal hernia. *Int J Surg* 20:28–34  
[CrossRef](https://doi.org/10.1016/j.ijssu.2015.05.055) (<https://doi.org/10.1016/j.ijssu.2015.05.055>)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=26074293) ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=26074293](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=26074293))  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Randomized%20clinical%20trial%20of%20C%20A%20Desarda%20C%20A%20versus%20Lichtenstein%20repair%20for%20treatment%20of%20primary%20inguinal%20hernia&author=T.%20Youssef&author=K.%20El-Alfy&author=M.%20Farid&journal=Int%20J%20Surg&volume=20&pages=28-34&publication_year=2015) ([http://scholar.google.com/scholar\\_lookup?title=Randomized%20clinical%20trial%20of%20C%20A%20Desarda%20C%20A%20versus%20Lichtenstein%20repair%20for%20treatment%20of%20primary%20inguinal%20hernia&author=T.%20Youssef&author=K.%20El-Alfy&author=M.%20Farid&journal=Int%20J%20Surg&volume=20&pages=28-34&publication\\_year=2015](http://scholar.google.com/scholar_lookup?title=Randomized%20clinical%20trial%20of%20C%20A%20Desarda%20C%20A%20versus%20Lichtenstein%20repair%20for%20treatment%20of%20primary%20inguinal%20hernia&author=T.%20Youssef&author=K.%20El-Alfy&author=M.%20Farid&journal=Int%20J%20Surg&volume=20&pages=28-34&publication_year=2015))
18. Bhatti I, Ishaqu H, Ahmad Z, Dar U (2015) Desarda's versus lichtenstein technique of hernia repair. *Pak J Med Health Sci* 9(4):1331  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Desarda%20E%20%99s%20versus%20lichtenstein%20technique%20of%20hernia%20repair&author=I.%20Bhatti&author=H.%20Ishaqu&author=Z.%20Ahmad&author=U.%20Dar&journal=Pak%20J%20Med%20Health%20Sci&volume=9&issue=4&pages=1331&publication_year=2015) ([http://scholar.google.com/scholar\\_lookup?title=Desarda%20E%20%99s%20versus%20lichtenstein%20technique%20of%20hernia%20repair&author=I.%20Bhatti&author=H.%20Ishaqu&author=Z.%20Ahmad&author=U.%20Dar&journal=Pak%20J%20Med%20Health%20Sci&volume=9&issue=4&pages=1331&publication\\_year=2015](http://scholar.google.com/scholar_lookup?title=Desarda%20E%20%99s%20versus%20lichtenstein%20technique%20of%20hernia%20repair&author=I.%20Bhatti&author=H.%20Ishaqu&author=Z.%20Ahmad&author=U.%20Dar&journal=Pak%20J%20Med%20Health%20Sci&volume=9&issue=4&pages=1331&publication_year=2015))
19. Ahmad I, Dwivedi AC, Srivastava SK, Singh HP, Singh AK (2016) randomized trial comparing Lichtenstein and Desarda technique for open inguinal hernia repair—a study of 100 patient. *J Dent Med Sci* 15(3):17–20. doi: [10.9790/0853-1503081720](https://doi.org/10.9790/0853-1503081720) (<https://doi.org/10.9790/0853-1503081720>)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=randomized%20trial%20comparing%20Lichtenstein%20and%20Desarda%20technique%20for%20open%20inguinal%20hernia%20repair%20E%20%99s%20study%20of%20100%20patient&author=I.%20Ahmad&author=AC.%20Dwivedi&author=SK.%20Srivastava&author=HP.%20Singh&author=AK.%20Singh&journal=J%20Dent%20Med%20Sci&volume=15&issue=3&pages=17-20&publication_year=2016&doi=10.9790%2F0853-1503081720) ([http://scholar.google.com/scholar\\_lookup?title=randomized%20trial%20comparing%20Lichtenstein%20and%20Desarda%20technique%20for%20open%20inguinal%20hernia%20repair%20E%20%99s%20study%20of%20100%20patient&author=I.%20Ahmad&author=AC.%20Dwivedi&author=SK.%20Srivastava&author=HP.%20Singh&author=AK.%20Singh&journal=J%20Dent%20Med%20Sci&volume=15&issue=3&pages=17-20&publication\\_year=2016&doi=10.9790%2F0853-1503081720](http://scholar.google.com/scholar_lookup?title=randomized%20trial%20comparing%20Lichtenstein%20and%20Desarda%20technique%20for%20open%20inguinal%20hernia%20repair%20E%20%99s%20study%20of%20100%20patient&author=I.%20Ahmad&author=AC.%20Dwivedi&author=SK.%20Srivastava&author=HP.%20Singh&author=AK.%20Singh&journal=J%20Dent%20Med%20Sci&volume=15&issue=3&pages=17-20&publication_year=2016&doi=10.9790%2F0853-1503081720))
20. Higgins JP, Altman DG, Gøtzsche PC, Jüni P, Moher D, Oxman AD, Savovic J, Schulz KF, Weeks L, Sterne JA, Cochrane Bias Methods Group, Cochrane Statistical Methods Group (2011) The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ* 343:d5928  
[CrossRef](https://doi.org/10.1136/bmj.d5928) (<https://doi.org/10.1136/bmj.d5928>)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=The%20Cochrane%20Collaboration%20E%20%99s%20tool%20for%20assessing%20risk%20of%20bias%20in%20randomised%20trials&author=JP.%20Higgins&author=DG.%20Altman&author=PC.%20G%C3%B8tzsche&author=P.%20J%C3%BCni&author=D.%20Moher&author=AD.%20Oxman&author=J.%20Savovic&author=KF.%20Schulz&author=L.%20Weeks&author=JA.%20Sterne&journal=BMJ&volume=343&pages=d5928&publication_year=2011) ([http://scholar.google.com/scholar\\_lookup?title=The%20Cochrane%20Collaboration%20E%20%99s%20tool%20for%20assessing%20risk%20of%20bias%20in%20randomised%20trials&author=JP.%20Higgins&author=DG.%20Altman&author=PC.%20G%C3%B8tzsche&author=P.%20J%C3%BCni&author=D.%20Moher&author=AD.%20Oxman&author=J.%20Savovic&author=KF.%20Schulz&author=L.%20Weeks&author=JA.%20Sterne&journal=BMJ&volume=343&pages=d5928&publication\\_year=2011](http://scholar.google.com/scholar_lookup?title=The%20Cochrane%20Collaboration%20E%20%99s%20tool%20for%20assessing%20risk%20of%20bias%20in%20randomised%20trials&author=JP.%20Higgins&author=DG.%20Altman&author=PC.%20G%C3%B8tzsche&author=P.%20J%C3%BCni&author=D.%20Moher&author=AD.%20Oxman&author=J.%20Savovic&author=KF.%20Schulz&author=L.%20Weeks&author=JA.%20Sterne&journal=BMJ&volume=343&pages=d5928&publication_year=2011))
21. Hay JM, Boudet MJ, Fingerhut A et al (1995) Shouldice inguinal hernia repair in the male adult: the gold standard? A multicentral controlled trial in 1578 patients. *Ann Surg* 222:719–727  
[CrossRef](https://doi.org/10.1097/00000658-199512000-00005) (<https://doi.org/10.1097/00000658-199512000-00005>)

**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=8526578](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=8526578))  
**PubMedCentral** (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1235020>)  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Shouldice%20inguinal%20hernia%20repair%20in%20the%20male%20adult%3A%20the%20gold%20standard%3F%20A%20multicentral%20controlled%20trial%20in%201578%20patients&author=JM.%20Hay&author=MJ.%20Boudet&author=A.%20Fingerhut&journal=Ann%20Surg&volume=222&pages=719-727&publication\\_year=1995](http://scholar.google.com/scholar_lookup?title=Shouldice%20inguinal%20hernia%20repair%20in%20the%20male%20adult%3A%20the%20gold%20standard%3F%20A%20multicentral%20controlled%20trial%20in%201578%20patients&author=JM.%20Hay&author=MJ.%20Boudet&author=A.%20Fingerhut&journal=Ann%20Surg&volume=222&pages=719-727&publication_year=1995))

22. **Shouldice EB (2003) The Shouldice repair for groin hernias. Surg Clin North Am 83:1163–1187**  
**CrossRef** ([https://doi.org/10.1016/S0039-6109\(03\)00121-X](https://doi.org/10.1016/S0039-6109(03)00121-X))  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=14533909](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=14533909))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=The%20Shouldice%20repair%20for%20groin%20hernias&author=EB.%20Shouldice&journal=Surg%20Clin%20North%20Am&volume=83&pages=1163-1187&publication\\_year=2003](http://scholar.google.com/scholar_lookup?title=The%20Shouldice%20repair%20for%20groin%20hernias&author=EB.%20Shouldice&journal=Surg%20Clin%20North%20Am&volume=83&pages=1163-1187&publication_year=2003))
23. **Junge K, Rosch R, Klinge U et al (2006) Risk factors related to recurrence in inguinal hernia repair: a retrospective analysis. Hernia 10:309–315**  
**CrossRef** (<https://doi.org/10.1007/s10029-006-0096-0>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=16721504](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=16721504))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Risk%20factors%20related%20to%20recurrence%20in%20inguinal%20hernia%20repair%3A%20a%20retrospective%20analysis&author=K.%20Junge&author=R.%20Rosch&author=U.%20Klinge&journal=Hernia&volume=10&pages=309-315&publication\\_year=2006](http://scholar.google.com/scholar_lookup?title=Risk%20factors%20related%20to%20recurrence%20in%20inguinal%20hernia%20repair%3A%20a%20retrospective%20analysis&author=K.%20Junge&author=R.%20Rosch&author=U.%20Klinge&journal=Hernia&volume=10&pages=309-315&publication_year=2006))
24. **National Institute of Clinical Excellence(NICE) (2004) Final appraisal determination, laparoscopic surgery for inguinal hernia repair. London**  
**Google Scholar** (<https://scholar.google.com/scholar?q=National%20Institute%20of%20Clinical%20Excellence%28NICE%29%20%282004%29%20Final%20appraisal%20determination%2C%20laparoscopic%20surgery%20for%20inguinal%20hernia%20repair.%20London>)
25. **Amid PK (2004) Lichtenstein tension-free hernioplasty: its inception, evolution, and principles. Hernia 8:1–7**  
**CrossRef** (<https://doi.org/10.1007/s10029-003-0160-y>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=14505236](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=14505236))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Lichtenstein%20tension-free%20hernioplasty%3A%20its%20inception%2C%20evolution%2C%20and%20principles&author=PK.%20Amid&journal=Hernia&volume=8&pages=1-7&publication\\_year=2004](http://scholar.google.com/scholar_lookup?title=Lichtenstein%20tension-free%20hernioplasty%3A%20its%20inception%2C%20evolution%2C%20and%20principles&author=PK.%20Amid&journal=Hernia&volume=8&pages=1-7&publication_year=2004))
26. **Kurzer M, Belsham PA, Kark AE (2003) The Lichtenstein repair for groin hernias. Surg Clin North Am 83:1099–1117**  
**CrossRef** ([https://doi.org/10.1016/S0039-6109\(03\)00134-8](https://doi.org/10.1016/S0039-6109(03)00134-8))



**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=14533906](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=14533906))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=The%20Lichtenstein%20repair%20for%20groin%20hernias&author=M.%20Kurzer&author=PA.%20Belsham&author=AE.%20Kark&journal=Surg%20Clin%20North%20Am&volume=83&pages=1099-1117&publication\\_year=2003](http://scholar.google.com/scholar_lookup?title=The%20Lichtenstein%20repair%20for%20groin%20hernias&author=M.%20Kurzer&author=PA.%20Belsham&author=AE.%20Kark&journal=Surg%20Clin%20North%20Am&volume=83&pages=1099-1117&publication_year=2003))

27. Verstraete L, Becaus N, Swannet H, Ceelen W, Duchateau L, Speybroeck N (2015) Long term outcome after lichtenstein hernia repair using general, locoregional or local anaesthesia. *Acta Chir Belg* 115(2):136–141  
**CrossRef** (<https://doi.org/10.1080/00015458.2015.11681083>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=26021947](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=26021947))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Long%20term%20outcome%20after%20Aolichtenstein%20Aohernia%20Aorepair%20Aousing%20general%20Aolocoregional%20or%20Aolocal%20anaesthesia&author=L.%20Verstraete&author=N.%20Becaus&author=H.%20Swannet&author=W.%20Ceelen&author=L.%20Duchateau&author=N.%20Speybroeck&journal=Acta%20Chir%20Belg&volume=115&issue=2&pages=136-141&publication\\_year=2015](http://scholar.google.com/scholar_lookup?title=Long%20term%20outcome%20after%20Aolichtenstein%20Aohernia%20Aorepair%20Aousing%20general%20Aolocoregional%20or%20Aolocal%20anaesthesia&author=L.%20Verstraete&author=N.%20Becaus&author=H.%20Swannet&author=W.%20Ceelen&author=L.%20Duchateau&author=N.%20Speybroeck&journal=Acta%20Chir%20Belg&volume=115&issue=2&pages=136-141&publication_year=2015))
28. Zieren J, Beyersdorff D, Beier KM et al (2001) Sexual function and testicular perfusion after inguinal hernia repair with mesh. *Am J Surg* 181(3):204–206  
**CrossRef** ([https://doi.org/10.1016/S0002-9610\(01\)00560-8](https://doi.org/10.1016/S0002-9610(01)00560-8))  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=11376571](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=11376571))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Sexual%20function%20and%20testicular%20perfusion%20after%20inguinal%20hernia%20repair%20with%20mesh&author=J.%20Zieren&author=D.%20Beyersdorff&author=KM.%20Beier&journal=Am%20J%20Surg&volume=181&issue=3&pages=204-206&publication\\_year=2001](http://scholar.google.com/scholar_lookup?title=Sexual%20function%20and%20testicular%20perfusion%20after%20inguinal%20hernia%20repair%20with%20mesh&author=J.%20Zieren&author=D.%20Beyersdorff&author=KM.%20Beier&journal=Am%20J%20Surg&volume=181&issue=3&pages=204-206&publication_year=2001))
29. Kulacoglu H (2011) Current options in inguinal hernia repair in adult patients. *Hippokratia* 15(3):223–231  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=22435019](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=22435019))  
**PubMedCentral** (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3306028>)  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Current%20options%20in%20inguinal%20hernia%20repair%20in%20adult%20patients&author=H.%20Kulacoglu&journal=Hippokratia&volume=15&issue=3&pages=223-231&publication\\_year=2011](http://scholar.google.com/scholar_lookup?title=Current%20options%20in%20inguinal%20hernia%20repair%20in%20adult%20patients&author=H.%20Kulacoglu&journal=Hippokratia&volume=15&issue=3&pages=223-231&publication_year=2011))
30. Earle DB, Mark LA (2008) Prosthetic material in inguinal hernia repair: how do I choose? *Surg Clin North Am* 88(1):179–201  
**CrossRef** (<https://doi.org/10.1016/j.suc.2007.11.002>)  
**PubMed** ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=18267169](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=18267169))  
**Google Scholar** ([http://scholar.google.com/scholar\\_lookup?title=Prosthetic%20material%20in%20inguinal%20hernia%20repair%3A%20how%20do%20I%20choose%3F&author=DB.%20Earle&author=LA.%20Mark&journal=Surg%20Clin%20North%20Am&volume=88&issue=1&pages=179-201&publication\\_year=2008](http://scholar.google.com/scholar_lookup?title=Prosthetic%20material%20in%20inguinal%20hernia%20repair%3A%20how%20do%20I%20choose%3F&author=DB.%20Earle&author=LA.%20Mark&journal=Surg%20Clin%20North%20Am&volume=88&issue=1&pages=179-201&publication_year=2008))

31. Losanoff JE, Millis JM (2006) Aponeurosis instead of prosthetic mesh for inguinal hernia repair: neither physiological nor new. *Hernia* 10(2):1981–1999  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Aponeurosis%20instead%20of%20prosthetic%20mesh%20for%20inguinal%20hernia%20repair%3A%20neither%20physiological%20nor%20new&author=JE.%20Losanoff&author=JM.%20Millis&journal=Hernia&volume=10&issue=2&pages=1981-1999&publication_year=2006) ([http://scholar.google.com/scholar\\_lookup?title=Aponeurosis%20instead%20of%20prosthetic%20mesh%20for%20inguinal%20hernia%20repair%3A%20neither%20physiological%20nor%20new&author=JE.%20Losanoff&author=JM.%20Millis&journal=Hernia&volume=10&issue=2&pages=1981-1999&publication\\_year=2006](http://scholar.google.com/scholar_lookup?title=Aponeurosis%20instead%20of%20prosthetic%20mesh%20for%20inguinal%20hernia%20repair%3A%20neither%20physiological%20nor%20new&author=JE.%20Losanoff&author=JM.%20Millis&journal=Hernia&volume=10&issue=2&pages=1981-1999&publication_year=2006))
32. Desarda MP (2003) Surgical physiology of inguinal hernia repair—a study of 200 cases. *BMC Surgery*. 3:2. doi: [10.1186/1471-2482-3-2](https://doi.org/10.1186/1471-2482-3-2)  
<https://doi.org/10.1186/1471-2482-3-2>  
[CrossRef](https://doi.org/10.1186/1471-2482-3-2) (<https://doi.org/10.1186/1471-2482-3-2>)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=12697071) ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=12697071](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=12697071))  
[PubMedCentral](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC155644) (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC155644>)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Surgical%20physiology%20of%20inguinal%20hernia%20repair%E2%80%944a%20study%20of%20200%20cases&author=MP.%20Desarda&journal=BMC%20Surgery.&volume=3&pages=2&publication_year=2003&doi=10.1186%2F1471-2482-3-2) ([http://scholar.google.com/scholar\\_lookup?title=Surgical%20physiology%20of%20inguinal%20hernia%20repair%E2%80%944a%20study%20of%20200%20cases&author=MP.%20Desarda&journal=BMC%20Surgery.&volume=3&pages=2&publication\\_year=2003&doi=10.1186%2F1471-2482-3-2](http://scholar.google.com/scholar_lookup?title=Surgical%20physiology%20of%20inguinal%20hernia%20repair%E2%80%944a%20study%20of%20200%20cases&author=MP.%20Desarda&journal=BMC%20Surgery.&volume=3&pages=2&publication_year=2003&doi=10.1186%2F1471-2482-3-2))
33. Desarda MP (2006) Physiological repair of inguinal hernia: a new technique (study of 860 patients). *Hernia* 10(2):143–146 **Epub 2005 Dec 9**  
[CrossRef](https://doi.org/10.1007/s10029-005-0039-1) (<https://doi.org/10.1007/s10029-005-0039-1>)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=16341627) ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=16341627](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=16341627))  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Physiological%20repair%20of%20inguinal%20hernia%3A%20a%20new%20technique%20%28study%20of%20860%20patients%29&author=MP.%20Desarda&journal=Hernia&volume=10&issue=2&pages=143-146&publication_year=2006) ([http://scholar.google.com/scholar\\_lookup?title=Physiological%20repair%20of%20inguinal%20hernia%3A%20a%20new%20technique%20%28study%20of%20860%20patients%29&author=MP.%20Desarda&journal=Hernia&volume=10&issue=2&pages=143-146&publication\\_year=2006](http://scholar.google.com/scholar_lookup?title=Physiological%20repair%20of%20inguinal%20hernia%3A%20a%20new%20technique%20%28study%20of%20860%20patients%29&author=MP.%20Desarda&journal=Hernia&volume=10&issue=2&pages=143-146&publication_year=2006))
34. Desarda MP, Ghosh DN (2006) Comparative study of open mesh repair and Desarda's nomesh repair in a district hospital in India. *East Central Afr J Surg* 11(2):18–34  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Comparative%20study%20of%20open%20mesh%20repair%20and%20Desarda%E2%80%99s%20nomesh%20repair%20in%20a%20district%20hospital%20in%20India&author=MP.%20Desarda&author=DN.%20Ghosh&journal=East%20Central%20Afr%20J%20Surg&volume=11&issue=2&pages=18-34&publication_year=2006) ([http://scholar.google.com/scholar\\_lookup?title=Comparative%20study%20of%20open%20mesh%20repair%20and%20Desarda%E2%80%99s%20nomesh%20repair%20in%20a%20district%20hospital%20in%20India&author=MP.%20Desarda&author=DN.%20Ghosh&journal=East%20Central%20Afr%20J%20Surg&volume=11&issue=2&pages=18-34&publication\\_year=2006](http://scholar.google.com/scholar_lookup?title=Comparative%20study%20of%20open%20mesh%20repair%20and%20Desarda%E2%80%99s%20nomesh%20repair%20in%20a%20district%20hospital%20in%20India&author=MP.%20Desarda&author=DN.%20Ghosh&journal=East%20Central%20Afr%20J%20Surg&volume=11&issue=2&pages=18-34&publication_year=2006))
35. Mitura K, Romańczuk M (2008) Comparison between two methods of inguinal hernia surgery—Lichtenstein and Desarda. *Pol Merkur Lekarski* 24(143):392–395  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=18634379) ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=18634379](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=18634379))  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Comparison%20between%20two%20methods%20of%20inguinal%20hernia%20surgery%E2%80%93Lichtenstein%20and%20Desarda&author=K.%20Mitura&author=M.%20Roma%C5%84czuk&journal=Pol%20Merkur%20Lekarski&volume=24&issue=143&pages=392-395&publication_year=2008) ([http://scholar.google.com/scholar\\_lookup?title=Comparison%20between%20two%20methods%20of%20inguinal%20hernia%20surgery%E2%80%93Lichtenstein%20and%20Desarda&author=K.%20Mitura&author=M.%20Roma%C5%84czuk&journal=Pol%20Merkur%20Lekarski&volume=24&issue=143&pages=392-395&publication\\_year=2008](http://scholar.google.com/scholar_lookup?title=Comparison%20between%20two%20methods%20of%20inguinal%20hernia%20surgery%E2%80%93Lichtenstein%20and%20Desarda&author=K.%20Mitura&author=M.%20Roma%C5%84czuk&journal=Pol%20Merkur%20Lekarski&volume=24&issue=143&pages=392-395&publication_year=2008))

36. Klinge U, Zheng H, Si ZY et al (1999) Synthesis of type I and III collagen, expression of fibronectin and matrix metalloproteinases1 and 13 in hernia sac of patients with inguinal hernia. *Int J Surg Investig* 1:219–227  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=11341610) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=11341610)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Synthesis%20of%20type%20I%20and%20III%20collagen%2C%20expressio n%20of%20fibronectin%20and%20matrix%20metalloproteinases1%20and%2013%20in%20hernia%20sac%20of%20patients%20with%20inguinal%20hernia&author=U.%20Klinge&author=H.%20Zheng&author=ZY.%20Si&journal=Int%20J%20Surg%20Investig&volume=1&pages=219-227&publication_year=1999) (http://scholar.google.com/scholar\_lookup?title=Synthesis%20of%20type%20I%20and%20III%20collagen%2C%20expressio n%20of%20fibronectin%20and%20matrix%20metalloproteinases1%20and%2013%20in%20hernia%20sac%20of%20patients%20with%20inguinal%20hernia&author=U.%20Klinge&author=H.%20Zheng&author=ZY.%20Si&journal=Int%20J%20Surg%20Investig&volume=1&pages=219-227&publication\_year=1999)
37. Zheng H, Si Z, Kasperk R et al (2002) Recurrent inguinal hernia: disease of the collagen matrix? *World J Surg* 26:401–408  
[CrossRef](https://doi.org/10.1007/s00268-001-0239-5) (https://doi.org/10.1007/s00268-001-0239-5)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=11910470) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=11910470)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Recurrent%20inguinal%20hernia%3A%20disease%20of%20the%20collage n%20matrix%3F&author=H.%20Zheng&author=Z.%20Si&author=R.%20Kasper k&journal=World%20J%20Surg&volume=26&pages=401-408&publication_year=2002) (http://scholar.google.com/scholar\_lookup?title=Recurrent%20inguinal%20hernia%3A%20disease%20of%20the%20collage n%20matrix%3F&author=H.%20Zheng&author=Z.%20Si&author=R.%20Kasper k&journal=World%20J%20Surg&volume=26&pages=401-408&publication\_year=2002)
38. Rutkow IM, Robbins AW (1993) Demographic, classificatory, and socioeconomic aspects of hernia repair in the United States. *Surg Clin North Am* 73(3):413–426  
[CrossRef](https://doi.org/10.1016/S0039-6109(16)46027-5) (https://doi.org/10.1016/S0039-6109(16)46027-5)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=8497793) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=8497793)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Demographic%2C%20classificatory%2C%20and%20socioeconomic%20aspe cts%20of%20hernia%20repair%20in%20the%20United%20States&author=IM.%20Rutkow&author=AW.%20Robbins&journal=Surg%20Clin%20North%20Am&v olume=73&issue=3&pages=413-426&publication_year=1993) (http://scholar.google.com/scholar\_lookup?title=Demographic%2C%20classificatory%2C%20and%20socioeconomic%20aspe cts%20of%20hernia%20repair%20in%20the%20United%20States&author=IM.%20Rutkow&author=AW.%20Robbins&journal=Surg%20Clin%20North%20Am&v olume=73&issue=3&pages=413-426&publication\_year=1993)
39. Taylor EW, Duffy K, Lee K, Hill R, Noone A, Macintyre I, King PM, O'Dwyer PJ (2004) Surgical site infection after groin hernia repair. *Br J Surg* 91(1):105–111  
[CrossRef](https://doi.org/10.1002/bjs.4365) (https://doi.org/10.1002/bjs.4365)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=14716803) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=14716803)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Surgical%20site%20infection%20after%20groin%20hernia%20repair&auth or=EW.%20Taylor&author=K.%20Duffy&author=K.%20Lee&author=R.%20Hill &author=A.%20Noone&author=I.%20Macintyre&author=PM.%20King&author= PJ.%20O%27Dwyer&journal=Br%20J%20Surg&volume=91&issue=1&pages=105-111&publication_year=2004) (http://scholar.google.com/scholar\_lookup?title=Surgical%20site%20infection%20after%20groin%20hernia%20repair&auth or=EW.%20Taylor&author=K.%20Duffy&author=K.%20Lee&author=R.%20Hill &author=A.%20Noone&author=I.%20Macintyre&author=PM.%20King&author= PJ.%20O%27Dwyer&journal=Br%20J%20Surg&volume=91&issue=1&pages=105-111&publication\_year=2004)
40. (1986) Classification of chronic pain. Descriptions of chronic pain syndromes and definitions of pain terms. Prepared by the International Association for the Study of Pain, Subcommittee on Taxonomy. *Pain Suppl* 3:S1-226  
[Google Scholar](https://scholar.google.com/scholar?q=%281986%29%20Classification%20of%20chronic%20pain.%20Descriptions%20of%20chronic%20pain%20syndromes%20and%20definitions%20of%20pain%20) (https://scholar.google.com/scholar?q=%281986%29%20Classification%20of%20chronic%20pain.%20Descriptions%20of%20chronic%20pain%20syndromes%20and%20definitions%20of%20pain%20)

20terms.%20Prepared%20by%20the%20International%20Association%20for%20the%20Study%20of%20Pain%2C%20Subcommittee%20on%20Taxonomy.%20Pain%20Suppl%203%3AS1-226)

41. Alfieri S, Amid PK, Campanelli G et al (2011) International guidelines for prevention and management of postoperative chronic pain following inguinal hernia surgery. *Hernia* 15:239–249  
CrossRef (<https://doi.org/10.1007/s10029-011-0798-9>)  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=21365287](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=21365287))  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=International%20guidelines%20for%20prevention%20and%20management%20of%20postoperative%20chronic%20pain%20following%20inguinal%20hernia%20surgery&author=S.%20Alfieri&author=PK.%20Amid&author=G.%20Campanelli&journal=Hernia&volume=15&pages=239-249&publication\\_year=2011](http://scholar.google.com/scholar_lookup?title=International%20guidelines%20for%20prevention%20and%20management%20of%20postoperative%20chronic%20pain%20following%20inguinal%20hernia%20surgery&author=S.%20Alfieri&author=PK.%20Amid&author=G.%20Campanelli&journal=Hernia&volume=15&pages=239-249&publication_year=2011))
42. BayNielsen M, Perkins FM, Kehlet H (2001) Pain and functional impairment 1 year after inguinal herniorrhaphy: a nationwide questionnaire study. *Ann Surg* 233:1–7  
CrossRef (<https://doi.org/10.1097/00000658-200101000-00001>)  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Pain%20and%20functional%20impairment%201%20year%20after%20inguinal%20herniorrhaphy%3A%20a%20nationwide%20questionnaire%20study&author=M.%20BayNielsen&author=FM.%20Perkins&author=H.%20Kehlet&journal=Ann%20Surg&volume=233&pages=1-7&publication\\_year=2001](http://scholar.google.com/scholar_lookup?title=Pain%20and%20functional%20impairment%201%20year%20after%20inguinal%20herniorrhaphy%3A%20a%20nationwide%20questionnaire%20study&author=M.%20BayNielsen&author=FM.%20Perkins&author=H.%20Kehlet&journal=Ann%20Surg&volume=233&pages=1-7&publication_year=2001))
43. de Goede B, Klitsie PJ, van Kempen BJ, Timmermans L, Jeekel J, Kazemier G, Lange JF (2013) Meta-analysis of glue versus sutured mesh fixation for Lichtenstein inguinal hernia repair. *Br J Surg* 100(6):735–742.  
doi: [10.1002/bjs.9072](https://doi.org/10.1002/bjs.9072) (<https://doi.org/10.1002/bjs.9072>)  
CrossRef (<https://doi.org/10.1002/bjs.9072>)  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=23436683](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=23436683))  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Meta-analysis%20of%20glue%20versus%20sutured%20mesh%20fixation%20for%20Lichtenstein%20inguinal%20hernia%20repair&author=B.%20Goede&author=PJ.%20Klitsie&author=BJ.%20Kempen&author=L.%20Timmermans&author=J.%20Jeekel&author=G.%20Kazemier&author=JF.%20Lange&journal=Br%20J%20Surg&volume=100&issue=6&pages=735-742&publication\\_year=2013&doi=10.1002%2Fbjs.9072](http://scholar.google.com/scholar_lookup?title=Meta-analysis%20of%20glue%20versus%20sutured%20mesh%20fixation%20for%20Lichtenstein%20inguinal%20hernia%20repair&author=B.%20Goede&author=PJ.%20Klitsie&author=BJ.%20Kempen&author=L.%20Timmermans&author=J.%20Jeekel&author=G.%20Kazemier&author=JF.%20Lange&journal=Br%20J%20Surg&volume=100&issue=6&pages=735-742&publication_year=2013&doi=10.1002%2Fbjs.9072))
44. McCormack K, Wake B, Perez J, Fraser C, Cook J, McIntosh E, Vale L, Grant A (2005) Laparoscopic surgery for inguinal hernia repair: systematic review of effectiveness and economic evaluation. *Health Technol Assess* 9(14):1–203  
CrossRef (<https://doi.org/10.3310/hta9140>)  
PubMed ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\\_uids=15842951](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=15842951))  
Google Scholar ([http://scholar.google.com/scholar\\_lookup?title=Laparoscopic%20surgery%20for%20inguinal%20hernia%20repair%3A%20a%20systematic%20review%20of%20effectiveness%20and%20economic%20evaluation&author=K.%20McCormack&author=B.%20W](http://scholar.google.com/scholar_lookup?title=Laparoscopic%20surgery%20for%20inguinal%20hernia%20repair%3A%20a%20systematic%20review%20of%20effectiveness%20and%20economic%20evaluation&author=K.%20McCormack&author=B.%20W))

ake&author=J.%20Perez&author=C.%20Fraser&author=J.%20Cook&author=E.%20McIntosh&author=L.%20Vale&author=A.%20Grant&journal=Health%20Technology%20Assessment&volume=9&issue=14&pages=1-203&publication\_year=2005)

45. Löfgren J, Nordin P, Ibingira C, Matovu A, Galiwango E, Wladis A (2016) A randomized trial of low-cost mesh in groin hernia repair. *N Engl J Med* 374(2):146–153  
[CrossRef](https://doi.org/10.1056/NEJMoa1505126) (https://doi.org/10.1056/NEJMoa1505126)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=26760085) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=26760085)  
[Google Scholar](http://scholar.google.com/scholar_lookup?title=A%20randomized%20trial%20of%20low-cost%20mesh%20in%20groin%20hernia%20repair&author=J.%20L.%20C3%B6fgren&author=P.%20Nordin&author=C.%20Ibingira&author=A.%20Matovu&author=E.%20Galiwango&author=A.%20Wladis&journal=N%20Engl%20J%20Med&volume=374&issue=2&pages=146-153&publication_year=2016) (http://scholar.google.com/scholar\_lookup?title=A%20randomized%20trial%20of%20low-cost%20mesh%20in%20groin%20hernia%20repair&author=J.%20L.%20C3%B6fgren&author=P.%20Nordin&author=C.%20Ibingira&author=A.%20Matovu&author=E.%20Galiwango&author=A.%20Wladis&journal=N%20Engl%20J%20Med&volume=374&issue=2&pages=146-153&publication\_year=2016)
46. Jones P, Jones S, Guarnieri F, Moscatelli F, Smaldone W, Nwamba C, Desarda M (2015) Inguinal hernia—mesh vs non mesh. *Hernia* 19(Suppl 1):S265–S266  
[CrossRef](https://doi.org/10.1007/BF03355369) (https://doi.org/10.1007/BF03355369)  
[PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list_uids=26518821) (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Abstract&list\_uids=26518821)  
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