

The Newly Proposed Modified Desarda's Technique, a Safe & More Resilient Repair for Indirect Inguinal Hernia in Terms of Late Recurrence in Contrast to Original Desarda's No Mesh Hernioplasty

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Current evidence suggests that Desarda's no mesh hernioplasty is a triumph over the conventional gold standard Lichtenstein mesh repair for evaluation of indirect inguinal hernia. Considering some certain possible surgical factors, in this research paper we are going to propose a new modification of Desarda's no mesh hernioplasty where modification of Desarda's technique is done by adding Modified Bassini's technique (Darn with continuous suturing with non-absorbable polypropylene suture). The results of this RCT reflect that surgical site infection was recorded as 15% & 12.5% in experimental (Group A) and control (Group B) groups. In Group A, approximately on day 03, the average pain score fall below 01, but in group B, the approximate length of it was 5 days after surgery. In question of average tenderness after surgery, in both groups, it was postoperative day 04 when the tenderness was found below 01. VAS trended to rise in both groups quite similarly in post-surgical period. Similar results were also observed in question of return to normal gait after surgery. So, results are comparable in case of both experimental and control group in terms of surgical site infection, average postoperative pain, tenderness, visual analogue evaluation and return to the normal gait after surgery. In contrast, differences were observed in the question of recurrence. Findings of this RCT suggest that early recurrence (within first 06 months which is mainly due to suboptimal operative technique and tissue failure) was nil in both groups, whereas in case of late recurrence, it was found to be significantly higher in control group (05%) in contrast to experimental group (00%). In summary, the newly proposed Modified Desarda's technique (Combined approach of Desarda's & Modified Bassini's technique) is a more resilient repair for indirect inguinal hernia in terms of late recurrence in contrast to Desarda's procedure alone.

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Introduction

In 1890, Eduardo Bassini described suture repair for inguinal hernia. This was a massive leap forward and has been the basis of open repair for over 100 years. The surgeon enters the inguinal canal by opening its anterior wall, the external oblique aponeurosis. The spermatic cord is dissected free and the presence of a lateral or a medial

hernia is confirmed. The sac of a lateral hernia is separated from the cord, opened and any contents reduced. The sac is then sutured closed at its neck and excess sac removed. If there is a medial hernia then it is inverted and the transversalis fascia is suture plicated. Sutures are now placed between the conjoint tendon above and the inguinal ligament

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below, extending from the pubic tubercle to the deep inguinal ring. The posterior wall of the inguinal canal is thus strengthened.¹

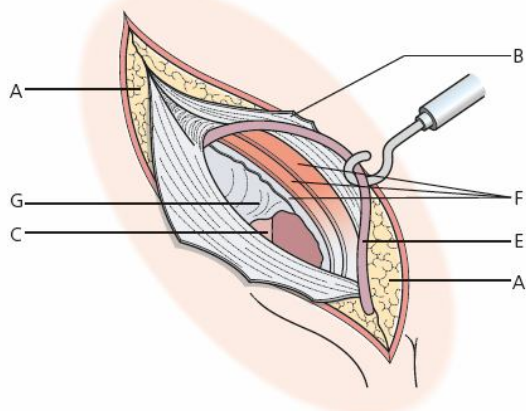


Figure 1: Bassini's original diagram. A, subcutaneous fat; B, external oblique; C, iliac vein; E, spermatic cord; F, nerves in inguinal canal; G, transversalis fascia.¹

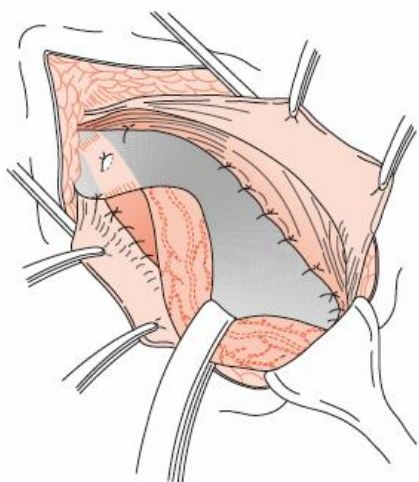


Figure 2: Lichtenstein repair¹

Over 150 modifications to the Bassini operation have been described with little or no benefit except for the Shouldice modification. In this operation, the transversalis fascia is opened by a central incision from the deep inguinal ring to the pubic tubercle and then closed to create a double-thick, two-layered posterior wall (double breasting). The external oblique is closed in similar fashion. Expert centres have reported lifetime failure rates of less than 2 per cent after Shouldice repair but it

is a technically demanding operation which, in general hands, gives results identical to the Bassini repair.¹

Today, when a Bassini-type operation is done, most surgeons use a continuous, non-absorbable nylon or polypropylene suture which is darned between the conjoint tendon and inguinal ligament. This operation was described by Maloney, and recently published large randomised trials have reported excellent results when compared to mesh techniques. It is the most common operation performed in countries where mesh is too expensive. Suture repair is still under development, and recently, Desarda has described an operation where a 1–2-cm strip of external oblique aponeurosis lying over the inguinal canal is isolated from the main muscle but left attached both medially and laterally. It is then sutured to the conjoint tendon and inguinal ligament, reinforcing the posterior wall of the inguinal canal. As the abdominal muscles contract, this strip of aponeurosis tightens to add further physiological support to the posterior wall. This operation is currently being evaluated.^{1,2}

Because of their frequency, inguinal hernias remain an important medical problem. The estimated lifetime risk for inguinal hernia is 27% for men and 3% for women.^{2,3} Annual morbidity rates in various countries vary from 100 to 300 per 100,000 citizens⁴. There were no written surgical guidelines for hernia treatment until 2009, when the European Hernia Society (EHS) published its recommendations based on analysis of the literature and the results of clinical trials. In the EHS guidelines, mesh-based techniques - the Lichtenstein technique in particular- and endoscopic methods are recommended for treatment of symptomatic primary inguinal hernia in adult men (strength of recommendation IA). In a

departure from this firm opinion presented by the EHS, the Shouldice method has been acknowledged to be acceptable as well⁵. Schumpelick emphasized the effectiveness of the Shouldice technique during his presentation at the 2011 EHS Congress in Ghent. Some questions can be asked considering these facts: Is the Shouldice technique the only non-mesh method that ensures good clinical results? Are any other tissue-based techniques effective in inguinal hernia repair if performed correctly?^{2,3}

The choice of a method depends on the surgeon; however, the ideal method for modern hernia surgery should be simple, cost effective, safe, tension free and permanent. The Lichtenstein operation to a great extent achieves all these goals.^{6,7} The Lichtenstein mesh, however has its shortcomings which include; its initial cost, non-availability in many parts of the developing world, tendency to fold and wrinkle, movement that may lead to mesh failure, since the groin is a very mobile area and chronic groin sepsis, that requires mesh removal.⁸ The predictors of medium term and long term outcomes are determined not only by the hernia characteristics, such as presence of a bulge at time of operation and the size of the defect, but also the short term postoperative pain and the length of time taken to resume work or usual duties.⁹

Desarda has described a new method that seems to satisfy the above criteria and does not require a prosthetic mesh and does not use weakened muscles or transversalis fascia for repair. It is cost effective with low rates of complications.^{10,11} The most commonly used method in most hospitals is the Modified Bassini¹² because it is easier to learn and cheaper in terms of initial costs.¹³

The posterior wall of the inguinal canal is weak and without dynamic movement in all

patients. Strong aponeurotic extensions are absent in the posterior wall. The muscle arch movement is lost or diminished in all patients. A physiologically dynamic and strong posterior inguinal wall, and the shielding and compression action of the muscles and aponeuroses around the inguinal canal are important factors that prevent hernia formation or hernia recurrence after repair. In addition, the squeezing and plugging action of the cremasteric muscle and binding effect of the strong cremasteric fascia, also play an important role in the prevention of hernia. And Desarda's no mesh hernioplasty is based on this idea.¹⁴

The synthetic prostheses most often used in the inguinal area can create new clinical problems, such as foreign body sensation in the groin, discomfort, and abdominal wall stiffness, which may affect the everyday functioning of the patient.¹⁵ Surgical-site infections, often with clinical symptoms delayed for many years, are more frequent after hernia treatment using mesh.^{16,17} Migration of the mesh from the primary site of implantation in the abdominal cavity is one of the most dangerous complications.^{18,19,20} Intense chronic inflammatory process typically associated with foreign body reactions around the mesh prosthesis may produce meshoma or plugoma tumors, the treatment of which becomes a new surgical challenge.^{21,22,23} Additionally, procreation and sexual function are reported seriously affected after surgical hernia treatment with mesh^{19,24}. Thus, we are still far from accomplishing everything in the hernia surgical field, and complications remain the major clinical problem.¹³

The observed complication rates and postoperative dysfunction have influenced many investigators to look for new hernia

repair techniques or to modify old ones. An example of such efforts is the Desarda method, which was presented in 2001 and became a new surgical option for tissue-based groin hernia repair^{25,26}. Because the results of the prospective study involving the technique were promising, as were the results presented by other authors.^{27,28}

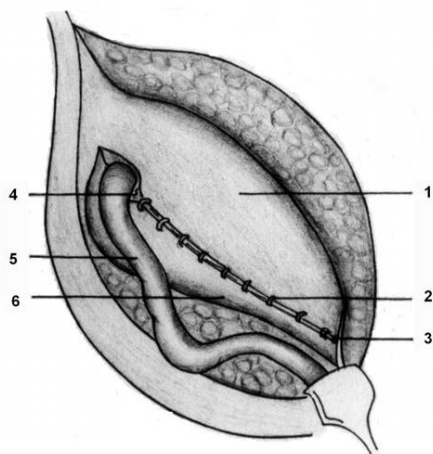


Figure 3. Desarda's technique: The medial leaf of the external oblique aponeurosis is sutured to the Inguinal ligament. 1) Medial leaf; 2) Interrupted sutures taken to suture the medial leaf to the inguinal ligament; 3) Pubic tubercle; 4) Abdominal ring; 5) Spermatic cord; and 6) Lateral leaf.^{29,30}

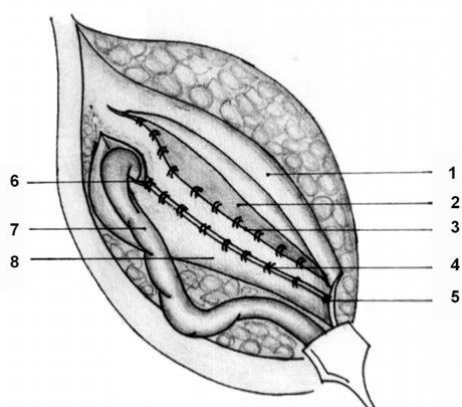


Figure 4. Desarda's technique: Undetached strip of external oblique aponeurosis forming the posterior wall of inguinal canal. 1) Reflected medial leaf after a strip has

been separated; 2) Internal oblique muscle seen through the splitting incision made in the medial leaf; 3) Interrupted sutures between the upper border of the strip and conjoined muscle and internal oblique muscle; 4) Interrupted sutures between the lower border of the strip and the inguinal ligament; 5) Pubic tubercle; 6) Abdominal ring; 7) Spermatic cord; and 8) Lateral leaf.^{29,30}

Considering all these issues and factors, in this research paper we are going to propose a new modification of Desarda's no mesh hernioplasty where modification of Desarda's technique is done by adding Modified Bassini's technique (Darn with continuous suturing with non-absorbable polypropylene suture). Here, we tried to evaluate the outcomes of this new technique in short and intermediate terms.

Methods

This study was designed as a RCT (Randomized Controlled Clinical Trial) among the 80 patients (40 patients of Modified Desarda's technique {modification of Desarda's technique by adding Modified Bassini's technique [Darn with continuous suturing with non-absorbable polypropylene suture]}; and 40 patients of Desarda's procedure alone) of indirect inguinal hernia in Surgery Unit 1 & 2, Khulna Medical Hospital, Bangladesh from a period of January 2009 to December 2010 with a view to depict the short & intermediate term (05 years) outcomes of newly proposed Modified Desarda's technique in contrast to Desarda's procedure. Male patients of 35 to 55 years of age group were included in this study based on inclusion & exclusion criteria. Major confounding variables like BMI, comorbidity, existing risk factors of recurrence, selection bias, type of suturing material, suturing technique, and different OT setup were eliminated or minimized at

an acceptable level in this RCT. All cases were performed as day case procedure under local anaesthesia (2% Lignocaine) balancing with sedation. At least 5 years follow up was done in case of all patients.

Systematic random sampling was used as the sampling technique. Data were processed, presented in tabulated form and discussed with compare & comparison on the basis of statistical analysis.

Results

This RCT (Randomized Controlled Clinical Trial) was conducted among the 80 patients of indirect inguinal hernia divided into 2 groups as follows:

Group A (Experimental group): 40 male patients of indirect inguinal hernia with Modified Desarda's technique {modification of Desarda's technique by adding Modified Bassini's technique [Darn with continuous suturing with non-absorbable polypropylene suture]}.

Group B (Control Group):40 patients of indirect inguinal hernia with Desarda's procedure alone.

The age distribution of study population is given in Table I.

Table I: Age distribution of the study population

Age in years	Number of patients	%	Mean±SD
Group A (Experimental group, n ₁ =40)			
35-40	08	20	43±2.1
41-45	17	42.5	
46-50	09	22.5	
50-55	06	15	
Total	40	100	
Group B (Control group, n ₂ =40)			
35-40	06	15	47±1.8
41-45	09	22.5	
46-50	14	35	
50-55	11	27.5	
Total	40	100	

Southampton's wound grading system was used to evaluate all patients in both groups to assess the surgical site infection. The findings are depicted in table II.

Table II: Grading of surgical site infections in both groups

Grade	Experimental group		Control group		P value
	No. of patients	%	No. of patients	%	
0	34	85	35	87.5	>0.05
Ia	02	05	01	2.5	
Ib	00	0.0	00	00	
Ic	01	2.5	01	2.5	
IIa	00	00	00	00	
IIb	01	2.5	00	00	
IIc	00	00	01	2.5	
IId	00	00	00	00	
IIIa	01	2.5	00	00	
IIIb	00	00	00	00	
IIIc	00	00	01	2.5	
IIId	00	00	01	2.5	
IVa	01	2.5	00	00	
IVb	00	00	00	00	
V	00	00	00	00	
Total	40		40		

The average pain & tenderness scores in the postoperative period are presented in figure 1 & 2 respectively.

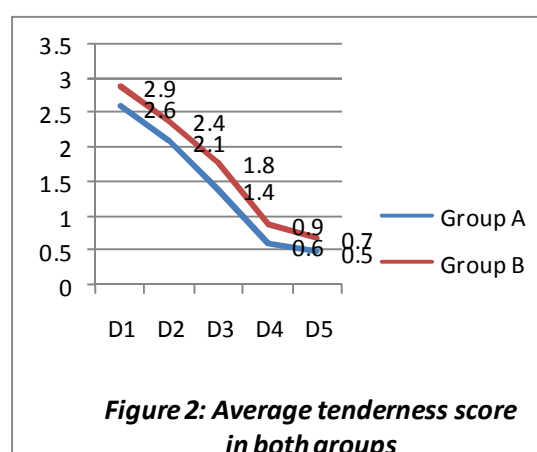
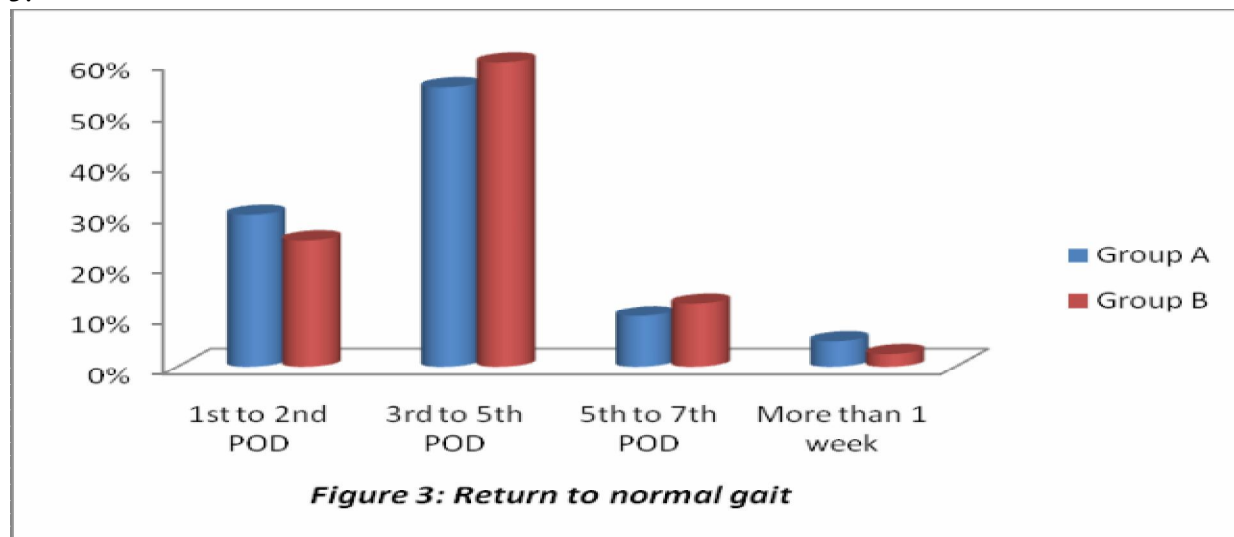


Table III reflects the average pain, tenderness & visual analogue score (VAS) scores in the postoperative period in both groups.

Table III: Average pain, tenderness & VAS in postoperative period in study population

Group A (Experimental group, n ₁ =40)						
	Postoperative day					
Pain Scoring (0-4)	D1	D2	D3	D4	D5	P value
Average Pain Score	3 to 2	2 to 1	< 1	< 1	<1 to 0	> 0.1
Tenderness Scoring (0-4)	D1	D2	D3	D4	D5	P value
Average Tenderness Score	3 to 2	3 to 2	2 to 1	< 1	<1	> 0.1
Visual Analogue Scale (VAS: 0-10)	D1	D2	D3	D4	D5	P value
Average score	6 to 7	<8	<9	<9	<9	> 0.1
Group B (Control group, n ₂ =40)						
Pain Scoring (0-4)	D1	D2	D3	D4	D5	P value
Average Pain Score	3 to 2	3 to 2	2- 1	< 1	<1 to 0	> 0.1
Tenderness Scoring (0-4)	D1	D2	D3	D4	D5	P value
Average Tenderness Score	3 to 2	3 to 2	2 to 1	< 1	<1	> 0.1
Visual Analogue Scale (VAS: 0-10)	D1	D2	D3	D4	D5	P value
Average score	6 to 7	<9	<9	<9	<9	> 0.1

Relationship between postoperative period and return to the normal gait is represented in figure 3.



The rate of early (within 06 months) and late recurrence (after 06 month onward, but in this study up to 05 years follow up is done only) in both groups is tabulated in table IV.

Table IV: Recurrence rate in both study groups

	Early recurrence	%	Late recurrence	%	P value
Group A	00	00	00	00	<0.01
Group B	00	00	02	05	

Discussion

The findings of this RCT suggest that results are comparable in case of both experimental and control group in terms of surgical site infection, average postoperative pain, tenderness, visual analogue evaluation and return to the normal gait after surgery. In contrast, differences were observed in the question of recurrence. Findings of the table IV suggest that early recurrence (within first 6 months which is mainly due to suboptimal operative technique and tissue failure) was nil in both groups, whereas in case of late recurrence, it was found to be significantly higher in control group (5%) in contrast to experimental group (0%).

Surgical site infection was recorded as 15% & 12.5% in group A & B respective (Table II). In Group A, approximately on day 03, the average pain score fall below 1, but in group B, the approximate length of it was 5 days after surgery (Table III, figure 1). In question of average tenderness after surgery, in both groups, it was postoperative day 4 when the tenderness was found below 1 (Table III, figure 2). VAS trended to rise in both groups quite similarly in post-surgical period (Table III). Similar results were also observed in question of return to normal gait after surgery (figure 3).

In a nutshell, the newly proposed Modified Desarda's technique (Combined approach of Desarda's & Modified Bassini's technique) is a more resilient repair for indirect inguinal hernia in terms of late recurrence in contrast to Desarda's procedure alone.

Recommendations

In conclusion of this study, it can be also said that however, this study was done in a comparatively limited number of study population and a narrow time scale, more research studies in this relation should be performed with sufficient number study population with a wider time scale to depict the original scenario in our clinical setup.

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References

1. Stephen JN, Bruce T, Abdominal wall, hernia and umbilicus, Bailey and Love's; Short practice of surgery; 26th edn: 2013: 957-958
2. Jacek S, Stanislaw D, Stanislaw P, Marek J, et al. Desarda Versus Lichtenstein Technique for Primary Inguinal Hernia Treatment: 3-Year Results of a Randomized Clinical Trial; World J Surg (2012) 36:984–992
3. Primatesta P, Goldacre MJ (1996) Inguinal hernia repair: incidence of elective and emergency surgery, readmission and mortality. Int J Epidemiol 25:835–839
4. Bay-Nielsen M, Kehlet H, Strand L et al (2001) Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. Lancet 358:1124–1128
5. 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
6. Amid PK, Shulman AG, Lichtenstein IL. The safety of mesh repair for primary inguinal hernias: results of 3019 operations from five diverse surgical sources. Am Surg 1992; 58:255-257
7. Samir A, Shawn S, Fagan P. Current approaches to inguinal hernia repair. Am J Surg 2004; 188: 9 – 16

8. Taylor SG, O'Dwyer PJ. Chronic groin sepsis following tension-free inguinal hernioplasty. *Br J Surg* 1999; 86: 562-5
9. J Cunningham, W J Temple, P Mitchell, J A Nixon, R M Preshaw. Comparative hernia study. Pain in the post repair patient. *Ann Surg*; 1996 Nov 224(5); 598-602
10. Desarda M.P. Surgical physiology of inguinal hernia repair – a study of 200 cases. *BMC Surgery* 2003; 3: 2
11. Desarda M P. Physiological repair of inguinal hernia – A new technique (Study of 860 patients) *Hernia*. 2005; 10: 143 – 146
12. Odula P.O, Kakande I. Groin Hernias Surgery at Mulago hospital, Uganda. The immediate outcome of groin hernia surgery in Mulago hospital. *East Central Afr J Surg* 2003; 9(1): 48-51
13. Situma SM, Kaggwa S, Masiira NM, Mutumba SK, Comparison of Desarda versus Modified Bassini inguinal Hernia Repair: A Randomized controlled trial; *East and Central African Journal of Surgery*; Volume 14 Number 2 – July/August 2009:70-77
14. Desarda MP, Surgical physiology of inguinal hernia repair - a study of 200 cases; *BMJ Surgery*; Vol 3; 16 April 2003
15. D'Amore L, Gossetti F, Vermeil V et al (2008) Long-term discomfort after plug and patch hernioplasty. *Hernia* 12:445–446
16. Genc V, Ensari C, Ergul Z et al (2010) A very late-onset deep infection after prosthetic inguinal hernia repair. *Chirurgia (Bucur)* 105:555–557
17. Scott NW, McCormack K, Graham P, et al (2002) Open mesh versus non-mesh for repair of femoral and inguinal hernia. *Cochrane Database Syst Rev* CD002197
18. Jeans S, Williams GL, Stephenson BM (2007) Migration after open mesh plug inguinal hernioplasty: a review of the literature. *Am Surg* 73:207–209
19. Ott V, Groebli Y, Schneider R (2005) Late intestinal fistula formation after incisional hernia using intraperitoneal mesh. *Hernia* 9:103–104
20. Benedetti M, Albertario S, Niebel T et al (2005) Intestinal perforation as a long-term complication of plug and mesh inguinal hernioplasty: case report. *Hernia* 9:93–95
21. McRoy LL (2010) Plugoma and the prolene hernia system. *J Am Coll Surg* 212:424 author reply 424–425
22. Miller JP, Acar F, Kaimaktchiev VB et al (2008) Pathology of ilioinguinal neuropathy produced by mesh entrapment: case report and literature review. *Hernia* 12:213–216
23. Fawole AS, Chaparala RPC, Ambrose NS (2006) Fate of the inguinal hernia following removal of infected prosthetic mesh. *Hernia* 10:58–61
24. Uzzo RG, Lemack GE, Morrissey KP et al (1999) The effects of mesh bioprosthesis on the spermatic cord structures: a preliminary report in a canine model. *J Urol* 161:1344–1349
25. Desarda MP (2001) Inguinal herniorrhaphy with an undetached strip of external oblique aponeurosis: a new approach used in 400 patients. *Eur J Surg* 167:443–448
26. Desarda MP (2001) New method of inguinal hernia repair: a new solution. *ANZ J Surg* 71:241–244
27. Mitura K, Romanczuk M (2008) Comparison between two methods of inguinal hernia surgery—Lichtenstein and Desarda. *Pol Merkur Lekarski* 24:392–395
28. Szopinski J, Kapala A, Prywinski S et al (2005) Desarda technique for inguinal hernia treatment: first Polish experiences. *Pol Przegl Chir* 77:159–168
29. Mohan PD, Surgical physiology of inguinal hernia repair - a study of 200 cases: *BMC Surgery* 2003, 3
30. Situma SM, Kaggwa S, Masiira NM, Mutumba SK, Comparison of Desarda versus Modified Bassini inguinal Hernia Repair: A Randomized controlled trial: *East Cent. Afr. j. surg.* (Online) ISSN 2073-9990