IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 1 Ser.13 (January. 2021), PP 01-05
www.iosrjournals.org

A Study on the Use of Polyethylene Mesh in Lichtensteins Mesh Repair of Inguinal Hernias

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Abstract:
Aim:
This study aims to evaluate the advantage of using mosquito net (polyethylene mesh) in terms of cost effectiveness in the treatment of inguinal hernia but with similar efficacy compared to polypropylene mesh in Inguinal Hernia patients who were admitted to GKMCH,KARUR.
Methods:
Patients presenting with inguinal hernias in GKMCH karur were recruited in this study. The patients were seen in surgical speciality OP in emergency and routine hours and were diagnosed on the basis of history & clinical examination. After obtaining consent, patients were required to fill in a proforma. After that patients were randomly divided into two groups. In the first group Lichtenstein's hernia repair were performed by polypropylene mesh. In the second group, Lichtenstein's hernia repair were done with mosquito net (polyethylene mesh).
Results:
In our study the majority of patients were male with only one case of female inguinal hernia in the study group. The mean age group of the patients in the study and control group was 48 with majority of patients above the age of 50. Patients in the study group (PE mesh) had less postoperative pain compared to the control group (PP mesh). The incidence of seroma formation, hematoma formation, wound infection were similar in both the study and control group. There was no difference in the incidence of foreign body sensation between polyethylene and polypropylene mesh observed during this study. Patients in the study group (PE mesh) returned to daily activities earlier than the control group (PP mesh) and the difference was significant. None of the cases in the PP mesh and PE mesh groups had recurrence.
Conclusion:
The use of polyethylene in lichtensteins mesh repair had similar efficacy compared to routine polypropylene mesh in terms of seroma formation, hematoma formation, wound infection, early recurrence and had lower incidence of post operative pain and early return to daily activities.The cost of a polypropylene mesh though is 20 times expensive than polyethylene.
Keywords: Polyethylene mesh, Lichtensteins mesh repair, Inguinal hernia

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Date of Submission: 07-01-2021 Date of Acceptance: 23-01-2021

I. Introduction :

A Hernia means 'To bud' or 'To protrude'[Greek] or 'Rupture'[Latin]. Hernia is defined as " an abnormal protrusion of the whole or a part of a viscous through a normal or abnormal opening with the sac covering it ".Inguinal Hernia is the most common type of hernia (73%) because the muscular anatomy in the inguinal region is weak and also due to the presence of natural weaknesses like deep ring and cord structures. Indirect hernia is more common than direct type.Other types of hernias are Femoral, Umbilical, Epigastric, Obturator, Spigelian, Lumbar etc.It has been said that the history of groin hernias is the history of surgery itself. Hernia repair is one of the most commonly performed general surgical procedures worldwide. Mesh based techniques particularly the Lichtenstein's tension free hernioplasty and Laparoscopic repairs were advocated for the treatment of symptomatic inguinal hernias in adults by the European Hernia Society. Lichtenstein's technique is currently the most popular and accepted technique among open mesh based techniques. It has minimal perioperative morbidity and is considered the standard of care.

Today, the gold standard of hernia repair in western countries is represented by the use of polypropylene meshes as prosthesis. A Lichtenstein type of operation has now become the method of choice in

most developed nations of the world. In the developing world, the traditional Bassini operation is still being performed in most centers due largely to the scarcity and expensive nature of the commercial prosthetic mesh

BACKGROUND AND PURPOSE OF THE STUDY:

The main purpose of this study is to analyze the advantage in terms of cost effectiveness of using polyethylene mesh in the treatment of inguinal hernia with similar efficacy compared to polypropylene mesh in Inguinal Hernia patients who are admitted to GKMCH,karur**.**

MATERIALS AND METHODS

Study Area : Government Medical College Hospital [KGMCH] , Karur.

Study population:

50 patients diagnosed with inguinal hernia were randomly divided into two groups.

Inclusion criteria:

1. Age > 40 years & < 65 years.
2. Those presenting with uncomplicated inguinal/inguinoscrotal hernia.
3. Patients who consented for inclusion in the study.

Exclusion criteria:

1. Age <40 years and > 65 years.
2. Patients with complicated hernias.
3. Patients with Bilateral hernias.
4. Patients with femoral hernias.
5. Patients having hernia with hydrocele.
6. Comorbid conditions.
7. Immunocompromised states.
8. Coagulopathy.
9. Patients who did not consent to the procedure.

Study Period:

12 Months. From Jan 2020 - Dec 2020

Sample Size:

50.

All patients eligible by inclusion and exclusion criteria were included in the study**.**

Study Design:

A prospective study was conducted on patients admitted in GKMCH,Karur. Informed consent were taken from each respondent.

Parameters to be studied:

Both groups were analyzed for,

Post-operative complications**:**

1. Pain
2. Hematoma formation
3. Seroma formation
4. Superficial/deep wound/mesh infection
5. Scrotal edema
6. Loss or change in sensation in the operated groin
7. Return to daily activities
8. Foreign body sensation
9. Recurrence

II. Methodology:

From January 2020 to december 2020, patients presenting with inguinal hernias in GKMCH, karur were recruited in this study. The patients were seen in surgical speciality OP in emergency and routine hours and were diagnosed on the basis of history & clinical examination. After obtaining consent, patients were required to fill in a proforma. After that patients were randomly divided into two groups. In the first group

Lichtenstein's hernia repair were performed by polypropylene mesh. In the second group, Lichtenstein's hernia repair were done with polyethylene mesh.

III. Discussion :

CHARACTERISTICS OF THE POLYETHYLENE MESH

The material used in the study is the indigeniously manufactured mosquito net made of a macroporous, monofilament, non absorbable polyethylene mesh. The mosquito net material was subjected to analysis for both physical and chemical properties at the SOUTH INDIA TEXTILE RESEARCH ASSOCIATION (SITRA), COIMBATORE. Before using the material in surgery, they were sterilized with ethylene oxide (EtO).

PHYSICAL PARAMETERS

Mean Filament yarn diameter mm 0.1153
Mean mesh thickness mm 0.4

Mean Pore area (pore part only)in sq.mm
Maximum 0.1237
Minimum 0.1038
Average 0.1153
Mean mesh GSM 37.6
Average Yarn Count (Denier) 91
Porosity % (Overall) 69.35
Thickness in mm. 0.39
Fabric Weight g/sq.mtr 37.53
Bursting Strength (Kgs/sq.cm) 4.9

Tensile Strength (Strip Method)-ISO
Warp Strength (kg) 16.94
Warp Elongation (%) 53.26
Weft Strength (kg) 14.59
Weft Elongation (%) 59.71

CHEMICAL PARAMETERS

No hazardous dye/insecticide were in the material used.The material used is polyethylene Position : Supine

PROCEDURE

Anaesthesia : Regional
Technique :

A 5-6 cm skin incision which starts from the pubic tubercle and extends laterally within the langer line, gives an excellent exposure of the pubic tubercle and the internal ring. The external Oblique aponeurosis is opened and it is separated from the cord structures and the internal oblique muscle.The cord with its cremaster covering is separated from the floor of the inguinal canal and the pubic bone for a distance of approximately 2 cm beyond the pubic tubercle.The internal ring is explored for indirect hernial sacs by incising the cremasteric sheath at the level of the deep ring. Indirect sacs are freed from the cord to a point beyond the neck of the sac and are inverted into the preperitoneal space with or without ligation depending on the surgeons preference.The wall of the excess distal sac is excised. Findings are confirmed in case of indirect / direct sac. A sheet of 8*16 cm mesh is used. Monofilament polypropylene meshes in the control group (monofilament polyethylene mesh in the study group) are preferred because their surface texture promotes fibroplasias and their monofilament structure do not perpetuate or harbor infection. The mesh is cut in the shape of a footprint, with a lower, sharp angle to fit into the angle between the inguinal ligament and the rectus sheath and an upper, wide angle to spread over the rectus sheath. With the cord retracted, the sharper corner is sutured with a non- absorbable suture material to the insertion of the rectus sheath to the pubic bone and overlapping the bone by 1-2 cm. (The periosteum is avoided). The overlapping mesh is sutured to the retcus. This suture is continued as a continuous suture attaching the mesh to the inguinal ligament upto a point just lateral to the internal ring. Suturing the mesh beyond this point is unnecessary and may injure the femoral nerve. A slit is made in the lateral end of the mesh, creating two tails, a wide one (two-thirds above) and a narrower one(one-thirds below). The wider upper one is

crossed and placed over the narrower one and sutured. The mesh is further fixed to the internal oblique and the rectus sheath. A suction drain is kept below the external oblique muscle. The wound is closed in layers.

IV. Results

In our study the majority of patients were male with only one case of female inguinal hernia in the study group. The mean age group of the patients in the study and control group was 54 with majority of patients above the age of 50 The incidence of post operative pain was calculated using visual analog score. Patients in the study group (PE mesh) had less postoperative pain compared to the control group (PP mesh) and the difference was significant. The incidence of seroma formation, hematoma formation, wound infection are similar in both the study and control group. Thus use of mosquito net (PE mesh) instead of PP mesh in Lichtenstein mesh repair does not alter the incidence of post operative pain, seroma formation, hematoma formation and wound infection. Foreign body sensation in the operated site is a common symptom following mesh repair. The prosthetic mesh introduced induces a fibrosis that strengthens the inguinal defect. This causes foreign body sensation in the inguinal region. There was no difference in the incidence of foreign body sensation between mosquito net(polyethylene) and polypropylene mesh observed during this study. Following suture removal on the 12th to 15th post operative day, and advised to do daily activities without straining and lifting heavy weights. Majority of the patients returned to daily activities within 15 days. Patients in the study group (PE mesh) returned to daily activities earlier than the control group (PP mesh) and the difference was significant. Patients were followed for 6months for incidence of recurrence in the operated side of inguinal region in the form of visible bulge or expansile cough impulse. None of the cases in the PP mesh and mosquito net (PE mesh) groups had recurrence.

V. Conclusion

The use of a polyethylene mesh in lichtensteins mesh repair had similar efficacy compared to routine polypropylene mesh in terms of seroma formation, hematoma formation, wound infection and early recurrence. However patients in the control group (PE mesh) had lower incidence of post operative pain and early return to daily activities than the study group (PP mesh). The cost of a polypropylene mesh though is 20 times expensive than a swadeshi material such as polyethylene. Thus in a developing country like india the use of polyethylene mesh(mosquito net) can be cost effective and thus be widely available to the underpreviledged. This study needs further evaluation as patients above 65 years of age, significant comorbid conditions and patients with hernia and hydrocele were not included in the study.

References

[1]. Ostow B. Guleph. What is the Most Appropriate Repair for Groin Hernias in Africa? . Surgery in Africa, Canada 2006.
[2]. Kingsnorth A, Leblanc K(2003). Hernias – Inguinal and Incisional . Lancet 362(9395) 1561- 1571.
[3]. Simons MP, Aufenacker T, Bay-Nielsen M. European Hernia Society Guidelines on the treatment of inguinal hernia in adult patients. Hernia 2009; 13:343
[4]. Taylor SG. O' Dwyer PJ. Chronic Groin Sepsis following tension free inguinal hernioplasty. Br J Surg. 1999; 86; 562-5
[5]. WILLIAM W.HOPE WILLIAM S.COBB GINA L ADRALES HERNIA SURGERY ; ISBN 978-3-319-43043-0 ;Pages 23-78
[6]. Master Techniques In Surgery – HERNIA; Daniel B.Jones Wolters Kluwer; Lippincott, Williams & Wilkins; ISBN 978-1-4511-0716-6; pages 1-24.
[7]. BD Chaurasia's Human Anatomy ; Seventh Edition; Volume 2; CBS Publishers and Distributors Pvt Ltd; ISBN: 978-93-85915-47-5; pages 216 – 237.
[8]. Chummy S. Sinnatamby; Last's Anatomy – Regional and Applied;Twelfth Edition; Churchill Livingstone; Elsevier; International ISBN:978 0 7020 3394 0.pages 221 – 232.
[9]. A Textbook Of Human Anatomy; T.S. Ranganathan; Sixth Edition;S.Chand & Company PVT.LTD; ISBN:978-81-219-0445-2.pages 261-271.
[10]. Mastery Of Surgery ; Fifth Edition ; Josef . E. Fischer; Wolters Kluwer; Lippincott ; Williams & Wilkins; ISBN: 978-0-7817-7165-8. Pages 1856 – 1859;1932 – 1939
[11]. SRB's Surgical Operations ; Text and Atlas; Sriram Bhat M; First Edition; Jaypee Brothers Medical Publishers (P) LTD; ISBN : 978-93-5025-121-8; pages 1121 – 1189.
[12]. Griffith CA. Inguinal Hernia: an anatomic-surgical correlation. Surg Cl North Am 1959;39;531
[13]. Tobin GR, Clark DS, Peacock EE Jr . A neuromuscular basis for development of indirect inguinal hernia. Arch Surg. 1976;111;464.
[14]. Peacock EE Jr, Madden JW. Studies on the biology and treatment of recurrent inguinal hernia. Ann Surg. 1974; 179;567.
[15]. Anson BJ, Mcvay CB, Philadelphia WB. Saunders . 5. Vol.1.1.1971. Surgical Anatomy; pp 461-532.
[16]. Anson BJ, Morgan EH, mcvay CB. Surgical Anatomy of the inguinal region based upon a study of 500 body halves. Surg Gynae col obstet 1960;111;707.
[17]. Read RC. A review: The role of protease-antiprotease imbalance in the pathogenesis of herniaton and abdominal aortic aneurysm in certain smokers. Postgraduate General Surgery. 1992;4;161-165

[18]. Surgical Physiology of Inguinal hernia repair – a study of 200 cases.BMC Surg 2001;3:2.
[19]. Ahmed R et al. Int Surg J 2018 Aug: 5(8)2723 – 2726.

Dr.A.Akshar, et. al. "A Study on the Use of Polyethylene Mesh in Lichtensteins Mesh Repair of Inguinal Hernias." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(01), 2021, pp. 01-05.