A Comparative Study Between Intra-Operative Difficulties and Postoperative Complications in Laparoscopic Inguinal Hernia Repair using Conventional Polypropylene Mesh and 3D Mesh A Meta-Analysis

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Research Article

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Abstract

Background: The fundamental mechanism of abdominal wall hernia formation is the loss of structural integrity at the musculotendinous layer. The idea of the Laparoscopic inguinal hernia repair is to repair the defect and put artificial/biological mesh. There is too many types of meshes differs from shape, size and material of the mesh.

Objective: To assess laparoscopic inguinal hernia repair using two different meshes: The conventional polyprolene mesh and the three-dimensional (3D) mesh, as regard the operative application time and post-operative complications including seroma, chronic pain, and recurrence using meta-analysis approach.

Patients and Methods: In our study ten trials included, three trials regarding 3d mesh versus conventional mesh in laparoscopic inguinal hernia repair, three trials regarding 3d mesh and four trials regarding polyprolene mesh.

Data Sources: Medline databases (PubMed, Medscape, ScienceDirect, EMF-Portal) and all materials available in the Internet till 2021.

Results: There is significant heterogeneity among trials (P = 0.002, I² = 84%), mean difference 1.17, 95% CI -2.18, 4.52 and there is no statistically significance z=0.49.

Conclusion: There is no difference between conventional polyprolene and 3d mesh regarding intra-operative difficulties (operative time) and post-operative complications (chronic pain, recurrence, operative time and seroma).

Introduction

Inguinal hernia repair is an extremely common operation performed by surgeons. More than 800,000 repairs performed annually. An inguinal hernia is an opening in the myofascial plain of the oblique and transversalis muscles that can allow for herniation of intra abdominal or extraperitoneal organs. The anatomy of the inguinal canal can be quite complex and thorough knowledge of anatomy from the preperitoneal view is imperative to perform a good laparoscopic inguinal hernia repair. Several important landmarks include the inferior epigastric vessels (which help distinguish between a direct and indirect hernia), the pubic bone/Cooper's ligament, the vas deferens/cord structures/round ligament, and the iliopubic tract. The used standard mesh is a Polypropylene mesh. (PPM). These are made of prolene fibers arranged in a network with pores of differing sizes. PPM is classified on the basis of density of the material and its surface area as heavyweight; middle weight and light weight. Three-dimensional mesh was developed by Dr. Pajotin in 1998, where he came to the realization that a flat sheet of mesh may not be the ideal configuration for a laparoscopic repair. The key benefits of 3D mesh as some recent studies suggest are: anatomically designed, easy positioning, fixation free, reduced post-operative pain, and reduced chronic post herniorraphy groin pain (inguinodynia). 3D Mesh Repair technique is an advanced method that uses Polypropylene mesh which covers the hernia defect from 3 sides; above, center and below. This tension-free repair is appropriate for treating big sized and recurrent hernias.

Methods

Search strategy

The PubMed, web of science and Scopus were searched on November 15, 2021. The keywords were inguinal hernia, groin hernia, 3d mesh, laparoscopic, and mesh. Relevant articles referenced in these primary studies were also searched to enroll additional cases, some articles were searched from the references of some studies and one article we have contacted their authors to send it on mail.

Search strategy will be shown in figure (1).

Eligibility criteria

All trials about the usage of 3d mesh and conventional mesh in laparoscopic inguinal hernia repair in patients above 18 years old and with unilateral or bilateral inguinal hernias were considered. Patients with complicated hernias as obstructed hernias or strangulated hernias, unfit for general anesthesia and refused laparoscopic hernia repair, in addition to papers with other languages than English and reviews, case reports or studies regarding animals were excluded.

Outcomes

Outcomes of this study included Recurrence, Chronic Pain, Operative Time and Seroma after laparoscopic inguinal hernia repair using conventional polyprolene mesh versus 3d mesh.
Quality assessment

Each article was assessed by two independent researchers based on the Cochrane Handbook 5.0.2.

The Cohort studies are assessed regarding: Selection, comparability and Outcome. **Good** = After considering, the items are rated “Yes” with no important limitations. This means that few of the items are rated “No,” and none of the limitations are thought to decrease the validity of the conclusions.

**Fair** = After considering, the items are rated “Yes,” but with at least some important limitations. This means that enough of the items are rated “No” to introduce some uncertainty about the validity of the conclusions.

**Poor** = After considering, the items are rated “No.” This means that several of the items are rated “No” introducing serious uncertainty about the validity of the conclusions.

The cohort study was evaluated with the following criteria: adequate sequence generation, allocation concealment, blinding of participants and outcome assessors, incomplete outcome data, free of selective reporting and free of other bias. Each type of bias was defined by an answer (Yes/No/Unclear) as in table (1,2).

“Yes” indicated low risk of bias, “No” represented high risk and “Unclear” represented unclear risk. In addition, the quality of evidence for each outcome was assessed by the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) system(33).

Methodological quality was assessed by two authors using the Newcastle–Ottawa Scale for cohort studies6

**Table (1)** Table shows quality assessment in cohort studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Selection</th>
<th>Comparability</th>
<th>Outcome</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tajamul 2017</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Elkomy 2020</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Mir 2015</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Bell 2003</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tiwari 2016</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>David 1992</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>C.Tamme 2016</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>S.A. Kapiris 2000</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Stylianos Kapiris 2009</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Table (2)** Table shows quality assessment in randomized controlled studies.
Statistical analysis

Statistical analysis was performed by Review Manager version 5.3 software. The odds ratio (OR) with 95% confidence interval (95% CI) for dichotomous variables and the mean difference (MD) with 95% CI for continuous variables were computed in fixed-effect or random-effect model.

Heterogeneity among trials was justified using Chi-squared test with $P < 0.1$ demonstrating statistical significance. The quantity of heterogeneity was measured by $I^2$ and $I^2 > 50\%$ indicated significant heterogeneity. If no significant heterogeneity was confirmed, we did the meta-analysis in fixed effect model. Or else, random-effect model was used.²

Results

Ten trials included, three trials regarding 3d mesh versus conventional mesh in laparoscopic inguinal hernia repair were selected from electronic databases. ³

Three trials regarding 3d mesh and four trials regarding polyprolene mesh. ⁴⁻⁶⁻⁷ The search process is shown in table 3

Table (3): Outcome parameters: 1: operative time; 2: seroma; 3: recurrence; 4: chronic pain

<table>
<thead>
<tr>
<th>Study</th>
<th>Study Design</th>
<th>Sample Size</th>
<th>types of mesh</th>
<th>Repair Method</th>
<th>FU/ Month</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tajamul 2017</td>
<td>Prospective Cohort</td>
<td>60</td>
<td>pp vs 3d</td>
<td>TEP vs TAPP</td>
<td>18 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Shah 2020</td>
<td>Randomised controlled trial</td>
<td>50</td>
<td>pp vs 3d</td>
<td>TEP vs TAPP</td>
<td>3 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Elkomy 2020</td>
<td>Prospective Cohort</td>
<td>30</td>
<td>pp vs 3d</td>
<td>TAPP</td>
<td>6 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Mir 2015</td>
<td>Retrospective Cohort</td>
<td>53</td>
<td>3d</td>
<td>TEP vs TAPP</td>
<td>12 ms</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Bells 2003</td>
<td>Retrospective cohort</td>
<td>146</td>
<td>3d</td>
<td>TEP</td>
<td>24 ms</td>
<td>1,2,4</td>
</tr>
<tr>
<td>Tiwari 2016</td>
<td>prospective cohort</td>
<td>48</td>
<td>3d</td>
<td>TAPP</td>
<td>3 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>David J. 2000</td>
<td>prospective cohort</td>
<td>40</td>
<td>Pp</td>
<td>TAPP</td>
<td>10 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>C.Tamme 2016</td>
<td>Retrospective cohort</td>
<td>5203</td>
<td>Pp</td>
<td>TEP vs TAPP</td>
<td>6ms</td>
<td>1,2,4</td>
</tr>
<tr>
<td>S.A. Kapiris 2000</td>
<td>retrospective cohort</td>
<td>3530</td>
<td>Pp</td>
<td>TAPP</td>
<td>6 to 72 ms</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Stylianos Kapiris 2009</td>
<td>prospective cohort</td>
<td>104</td>
<td>Pp</td>
<td>TAPP</td>
<td>50 ms</td>
<td>1,2,3,4</td>
</tr>
</tbody>
</table>

FU follow-up, TAPP Transabdominal Preperitoneal Repair, TEP Total Extraperitoneal Repair

Operation time

Operative time was assessed in three included studies comparing between 3d mesh and polyprolene conventional mesh. Figure 2

Seroma

Seroma was assessed in three included studies comparing between 3d mesh and polyprolene conventional mesh. Figure 3

Seroma was assessed in four included studies using polyprolene conventional mesh. Figure 4

Recurrence

Four included studies described recurrence using conventional polyprolene mesh. Figure 5 Three included studies described recurrence using 3d mesh with follow-up at least 3 months. Figure 6

Chronic pain
Chronic pain was assessed in three included studies comparing between 3d mesh and polyprolene conventional mesh. Figure 7

Chronic pain was assessed in four included studies using polyprolene conventional mesh. Figure 8

Chronic pain was assessed in three included studies using 3d mesh. Figure 9

**Sensitivity**

Regarding sensitivity in operative time in three trials the overall effect is 0.972 by removing Tajamal et al study overall effect is 2.141, and by removing Shah et al study overall effect is -0.714 and by removing Elkomy et al overall effect is 0.938 there was deviation on the result when leaving one paper out as seen in Fig. 10

Regarding sensitivity in seroma in three trials the overall effect is 2.490 by removing Tajamal et al study overall effect is 2.725, and by removing Shah et al study overall effect is 2.712 and by removing Elkomy et al overall effect is 2.079 there was no effect when leaving one paper out as seen in Fig. 11

Regarding sensitivity in pain in three trials the overall effect is 2.572 by removing Tajamal et al study overall effect is 2.701, and by removing Shah et al study overall effect is 2.797 and by removing Elkomy et al overall effect is 2.148 there was no effect when leaving one paper out as seen in Fig. 12

**Discussion**

The current meta-analysis is to compare between intra-operative difficulties and early postoperative complications in laparoscopic inguinal hernia repair using conventional polypropylene mesh and 3D mesh. We have comprehensively searched and assessed the published literature regarding this topic. Our study included ten trials with 9264 participants, three trials regarding 3D mesh versus conventional mesh in laparoscopic inguinal hernia repair, three trials regarding 3D mesh and four trials regarding polyprolene mesh. Operative time was assessed in three included studies comparing between 3D mesh and polyprolene conventional mesh. Elkomy et al. stated 42 minutes mean time with standard deviation +13 using 3D mesh and 45 minutes mean time with standard deviation +15 using polyprolene. Shah et al. stated 15 minutes mean time with standard deviation +0.7 using 3D mesh and 12 minutes mean time with standard deviation +0.74 using polyprolene and Tajamul et al. stated 7 minutes mean time with standard deviation +3 using 3D mesh and 7 minutes mean time with standard deviation + 2.6 using polyprolene mesh.

Therefore, there is statistically significant heterogeneity among trials ($P = 0.002, \ I^2 = 84\%$), mean difference $1.17$, $95\%$ CI $-2.18, 4.52$, but there is no statistically significant in which $p$ value in $z$ test is 0.49. Regarding, Seroma was assessed in three included studies comparing between 3D mesh and polyprolene conventional mesh. Elkomy et al. stated 3 patients suffered from seroma using conventional mesh and 1 patient using 3D mesh in 6 months follow-up, Shah et al. stated 2 patients suffered from seroma using conventional mesh and 1 patient using 3D mesh in 3 months follow-up, and Tajamul et al. stated 2 patients suffered from seroma using conventional mesh and 1 patient using 3D mesh in 2 months follow-up. There was no significant heterogeneity among trials ($P = 0.94, \ I^2 = \%$), OR $0.4, 95\%$ CI $0.1, 0.16$ and no statically significance as $z = 1.27$. In comparison with four included studies using polyprolene conventional mesh. David J. et al. stated 2 patients suffered from seroma in 10 months follow-up, C.Tamme et al. stated 1 patient in 3 months follow-up, S.A. Kapiris et al. stated 282 patients in 6 to 72 months follow-up and Stylianos Kapiris et al. stated 11 patients in 50 months follow-up, with ($P = 0.01, \ I^2 = 99\%$). As regarding, recurrence was assessed in four included studies using conventional polyprolene mesh with follow-up at least 3 months. David J. et al. stated zero patients suffered from recurrence in 10 months follow-up, C.Tamme et al. stated 9 patients in 3 months follow-up, S.A. Kapiris et al. stated 22 patients in 6 to 72 months follow-up and Stylianos Kapiris et al. stated 1 patient in 50 months follow-up, with ($P = 0.66, \ I^2 = \%$) and pooled relative risk is 0.001.

Three included studies described recurrence using 3D mesh with follow-up at least 3 months. Mir et al. stated zero patients suffered from recurrence in 12 months follow-up, Tiwari et al. stated 1 patient in 12 months follow-up, and Bells et al. stated 1 patient in 24 months follow-up, with ($P = 0.97, \ I^2 = \%$) and pooled relative risk is 0.01. Therefore, there is no statistically significance between polyprolene and 3D mesh in recurrence rate. As regarding, recurrence was assessed in four included studies using conventional polyprolene mesh with follow-up at least 3 months. David J. et al. stated zero patients suffered from recurrence in 10 months follow-up, C.Tamme et al. stated 9 patients in 3 months follow-up, S.A. Kapiris et al. stated 22 patients in 6 to 72 months follow-up and Stylianos Kapiris et al. stated 1 patient in 50 months follow-up, with ($P = 0.66, \ I^2 = \%$) and pooled relative risk is 0.001. Three included studies described recurrence using 3D mesh with follow-up at least 3 months. Mir et al. stated zero patients suffered from recurrence in 12 months follow-up, Tiwari et al. stated 1 patient in 12 months follow-up, and Bells et al. stated 1 patient in 24 months follow-up, with ($P = 0.97, \ I^2 = \%$) and pooled relative risk is 0.01. Therefore, there is no statistically significance between polyprolene and 3D mesh in recurrence rate. Chronic pain is one of the most serious long-term complications following groin hernia repair. Surgical dissection, mesh fixation, and mesh-induced entrapment have been cited as the potential causes of groin pain.

Chronic pain was assessed in three studies comparing between 3D mesh and polyprolene conventional mesh. Elkomy et al. stated 8 patients suffered from chronic pain using conventional mesh from 15 total patients and 4 patients using 3D mesh in 6 months follow-up from 15 total patients, Shah et al. stated 4 patients suffered from chronic pain in 6 months using conventional mesh from 25 total patients and 2 patients using 3D mesh from 25 total patients, while Tajamul et al. stated 2 patients suffered from chronic pain using conventional mesh from 30 total patients.
and 1 patient using 3d mesh in 2 months follow-up from 30 total patients. There was no significant heterogeneity among trials ($P = 0.55$, $I^2 = 0\%$), OR 0.61, 95% CI 0.22, 1.68 and no statistically significance $Z = 0.96$.

Chronic pain was assessed in four included studies using polyprolene conventional mesh. David J. et al. stated 2 patients suffered from chronic pain in 10 months follow-up, C. tamme et al. stated 9 patients suffered from chronic pain in 3 months follow-up, S.A Kapiris et al. stated 17 patients suffered from chronic pain in 6 to 72 months follow-up and Stylianos kapiris et al. stated 1 patients suffered from chronic pain in 50 months follow-up ($P = 0.189$, $I^2 = 37\%$) with pooled relative risk 0.02.

Chronic pain was assessed in three included studies using 3d mesh Mir et al. stated 2 patients suffered from chronic pain in 12 months follow-up, Pyrianka et al. stated 2 patients suffered from chronic pain in 12 months follow-up and bells et al. stated 2 patients in 24 months follow-up ($P = 0.49$, $I^2 = 0\%$) with pooled relative risk 0.02.

Our limitation is few number of studies comparing both 3d mesh and conventional polyprolene. In addition, heterogeneity was present in the results but, with no significance due to the several factors discussed previously. We also noted high risk of bias in some of the included studies due to either the patient selection or methodology.

**Conclusion**

There is no difference between conventional polyprolene and 3d mesh regarding intra-operative difficulties (operative time) and post-operative complications (chronic pain, recurrence, operative time and seroma).

**Declarations**

I declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere.

**Consent for publication:**

Not applicable

**Acknowledgement:**

I am grateful to all my colleagues I have had the pleasure to work during this and other related projects. Each member has provided me extensive personal and professional guidance and taught me a great deal about both scientific research and life in general.

**Ethical approval and consent to participate:**

Not applicable as my thesis is a meta-analysis

**Availability of data and materials:**

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

**Conflict of interests:**

I confirm that neither I nor my colleague nor any business with which I am associated have any personal or business interest or potential for personal gain from any of the organizations.

**Funding:**

Not applicable

**Authors’ contribution:**

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Philobater Bahgat Adly Awad

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we both contribute with the same percent
References


Figures
Figure 1

Shown PRISMA flowchart

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Weight</th>
<th>Mean Difference IV, Random, 95% CI</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elkomy 2020</td>
<td>38.6%</td>
<td>0.00 [-2.25, 2.25]</td>
<td></td>
</tr>
<tr>
<td>Shah 2020</td>
<td>46.4%</td>
<td>-3.50 [-3.90, -3.10]</td>
<td></td>
</tr>
<tr>
<td>Tajamul 2017</td>
<td>15.1%</td>
<td>3.00 [-4.10, 10.10]</td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>100.0%</td>
<td>-1.17 [-4.52, 2.18]</td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 6.25; \chi^2 = 12.13, df = 2 (P = 0.002); I^2 = 84%$

Test for overall effect: $Z = 0.69 (P = 0.49)$

Figure 2

Shows operative time in 3d mesh versus conventional polypropylene mesh.
Figure 3

Shows seroma in 3D mesh versus conventional polypropylene mesh

<table>
<thead>
<tr>
<th>Studies</th>
<th>Estimate (95% C.I.)</th>
<th>Ev/Trt</th>
</tr>
</thead>
<tbody>
<tr>
<td>David J. Winchester 1992</td>
<td>0.05 (0.00, 0.12)</td>
<td>2/40</td>
</tr>
<tr>
<td>C. Tamme 2016</td>
<td>0.00 (0.00, 0.00)</td>
<td>1/5203</td>
</tr>
<tr>
<td>S. A. Kapiris 2000</td>
<td>0.05 (0.05, 0.06)</td>
<td>282/5350</td>
</tr>
<tr>
<td>Stylianos Kapiris 2009</td>
<td>0.11 (0.05, 0.16)</td>
<td>11/104</td>
</tr>
<tr>
<td>Overall (I²=99%, P=0.01)</td>
<td>0.05 (0.00, 0.09)</td>
<td>296/10697</td>
</tr>
</tbody>
</table>

Figure 4

Shows seroma in conventional polypropylene mesh

<table>
<thead>
<tr>
<th>Studies</th>
<th>Estimate (95% C.I.)</th>
<th>Ev/Trt</th>
</tr>
</thead>
<tbody>
<tr>
<td>David J. Winchester 1992</td>
<td>0.01 (0.00, 0.05)</td>
<td>0/40</td>
</tr>
<tr>
<td>C. Tamme 2016</td>
<td>0.01 (0.00, 0.01)</td>
<td>29/5203</td>
</tr>
<tr>
<td>S. A. Kapiris 2000</td>
<td>0.00 (0.00, 0.01)</td>
<td>22/5350</td>
</tr>
<tr>
<td>Stylianos Kapiris 2009</td>
<td>0.01 (0.00, 0.03)</td>
<td>1/104</td>
</tr>
<tr>
<td>Overall (I²=0%, P=0.66)</td>
<td>0.00 (0.00, 0.01)</td>
<td>52/10697</td>
</tr>
</tbody>
</table>

Figure 5

Shows recurrence in polypropylene mesh
Figure 6

Shows recurrence in 3d mesh

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Weight</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
<th>Odds Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elkomy 2020</td>
<td>51.9%</td>
<td>1.00 [0.25, 4.06]</td>
<td></td>
</tr>
<tr>
<td>Shah 2020</td>
<td>31.6%</td>
<td>0.46 [0.08, 2.75]</td>
<td></td>
</tr>
<tr>
<td>Tajamul 2017</td>
<td>16.5%</td>
<td>0.22 [0.02, 2.70]</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>0.61 [0.22, 1.68]</strong></td>
<td></td>
</tr>
</tbody>
</table>

Total events

Heterogeneity: Tau² = 0.00; Chi² = 1.20, df = 2 (P = 0.55); I² = 0%

Test for overall effect: Z = 0.96 (P = 0.34)

Figure 7

Showing chronic pain in 3d versus conventional polyprolene

<table>
<thead>
<tr>
<th>Studies</th>
<th>Estimate (95% C.I.)</th>
<th>Ev/Trt</th>
</tr>
</thead>
<tbody>
<tr>
<td>David J. Winchester 1992</td>
<td>0.050 (0.000, 0.118)</td>
<td>2/40</td>
</tr>
<tr>
<td>C. Tambme 2016</td>
<td>0.002 (0.001, 0.003)</td>
<td>9/5203</td>
</tr>
<tr>
<td>S. A. Kapiris 2000</td>
<td>0.003 (0.002, 0.005)</td>
<td>17/5350</td>
</tr>
<tr>
<td>Stylianos Kapiris 2009</td>
<td>0.010 (0.000, 0.028)</td>
<td>1/104</td>
</tr>
<tr>
<td><strong>Overall (I²=37%, P=0.189)</strong></td>
<td>0.002 (0.001, 0.004)</td>
<td>29/10697</td>
</tr>
</tbody>
</table>

Figure 8

Shows pain in conventional polyprolene mesh
Figure 9
Shows pain in 3d mesh.

Figure 10
Operative time sensitivity.

Figure 11
Seroma sensitivity.
Studies Estimate (95% C.I.)

Overall 2.372 (0.898, 7.369)

- Tajamul 2017 2.701 (0.843, 8.656)
- Shah 2020 2.797 (0.764, 10.245)
- Elkomy 2020 2.148 (0.504, 9.163)

Figure 12

Pain sensitivity.