# Comparison of two fascial defect closure methods for laparoscopic incisional hernia repair.

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## Introduction

- Hernia defects >2cm are at increased risk of incarceration which sometimes necessitates emergent repair and compromised outcomes
- No consensus regarding the ideal surgical approach to an incisional hernia measuring less than 10cm, however defect closure is ideal for preventing mesh eventration and improving outcomes.
- This retrospective cohort study was designed to compare incisional hernia defects repaired with laparoscopic suture closure to a hybrid approach with open defect closure, both with laparoscopic intraperitoneal onlay mesh (IPOM) reinforcement

## Methods and procedures

- 164 consecutive patients who underwent incisional hernia repair from two centers, North York General Hospital (NYGH) and Humber River Hospital (HRH) between 2015-2020
- Primary outcomes: surgical site infection (SSI), other wound complications including seroma/hematoma, post-operative pain, length of hospital stay, pain reported at follow-up appointment, and hernia recurrence

### Hybrid Technique

**Laparoscopic phase:** defect assessment, adhesiolysis, reduction

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**Open phase**: incision of old scar, adhesiolysis, hernia sac resected

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Mesh inserted, closure of hernia defect primarily, fixating the tails on the mesh

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**2nd laparoscopic phase**: circumferential tacking to the abdominal wall **without transfascial sutures**

### Laparoscopic Technique

Adhesiolysis and reduction of contents

↓

Defect closure **against pneumoperitoneum** – running barbed suture or interrupted figure-of-eight knots

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Suture passer used to place **transfascial sutures** to fix the mesh at cardinal positions

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Circumferential tacking to the abdominal wall

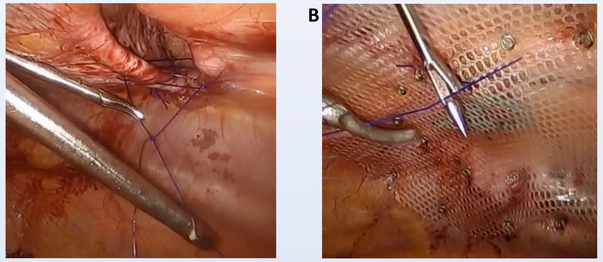



Figure 1. A) Interrupted figure-of-eight slip knots with #1 prolene sutures. B) Suture passer used for transfascial fixation sutures with double crown of permanent tacks.

- All patients included had midline hernias, with M-zones M2-M4 (M2: epigastric, M3: umbilical, M4: infraumbilical). Most patients had small size (width < 4cm) or medium sized (width ≥ 4-10cm) hernias.

## Results

| | Laparoscopic (n = 120) | Hybrid (n = 44) | P value |
|---|---|---|---|
| Gender | | | 0.61 |
| Male | 60 | 20 | |
| Female | 60 | 24 | |
| Age (years) | 60 (49-68) | 64 (55-70) | 0.11 |
| Body Mass Index (BMI) | 32 (29-36) | 38 (29-42) | 0.02* |
| Number of hernias repaired | | | 0.30 |
| 1 | 97 | 34 | |
| >1 | 18 | 10 | |
| Largest hernia defect repaired (cm) | 3 (2-5) | 5 (4-6) | 0.01* |
| Mesh size length (cm) | 15 (12-15) | 15 (15-20) | 0.08 |
| Mesh size width (cm) | 15 (12-15) | 15 (15-15) | 0.18 |

| | Laparoscopic (n = 120) | Hybrid (n = 44) | P value |
|---|---|---|---|
| ASA class | | | 0.98 |
| I | 2 | 2 | |
| II | 28 | 85 | |
| III | 13 | 33 | |
| IV | 0 | 0 | |

| | Laparoscopic (n = 120) | Hybrid (n = 44) | P value |
|---|---|---|---|
| Median length of stay (days) | 1 (1-2) | 0.5 (0-2) | 0.01 |
| Median time to follow up (months) | 1 (1-7) | 3 (1-11) | 0.10 |
| Superficial surgical site infection (SSI) | | | 0.18 |
| No | 119 | 42 | |
| Yes | 1 | 2 | |
| Seroma or hematoma present at follow-up | | | 0.61 |
| No | 97 | 34 | |
| Yes | 23 | 10 | |
| Reported pain present at follow-up | | | 0.38 |
| No | 107 | 37 | |
| Yes | 13 | 7 | |
| Recurrence at follow-up | | | 0.82 |
| No | 113 | 41 | |
| Yes | 7 | 3 | |
| Median time to recurrence (months) | 15 (8-21) | 7 (6-36) | 0.73 |

- No significant differences observed in post-operative surgical site infections, pain or seromas
- Hybrid patients had significantly larger hernia defects and higher BMI and overall statistically significant shorter length of stay
- Recurrence rates were 5.8% and 6.8% for the laparoscopic and hybrid group respectively, which were not significantly different

## Conclusions

- Hybrid approach to incisional hernia repair eliminates the need for intracorporeal suturing against pneumoperitoneum and allows for complete resection of the hernia sac
- Despite having a mini-laparotomy incision, the hybrid approach carries a similar risk of wound complications, pain and recurrence as a purely laparoscopic approach
- A hybrid approach facilitates primary defect closure and does not require transfascial mesh fixation
- Our data suggest that a hybrid approach is a safe alternative to a purely laparoscopic technique in obese patients with small to medium sized hernia defects up to 6cm