



## Predavanja

### *Lectures*

## ***Single incision laparoscopic surgery - incisional hernia repair***

### **Laparoskopski poseg skozi en rez - operacija incizijske kile**

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### ***Abstract***

*Advancement in technology enabled a surge of single incision laparoscopic surgery (SILS). We introduce incisional hernia repair into the scope of SILS operations. Main argument in favour of this idea is that every incision and trocar placement presents a risk for bleeding, organ damage, decreases cosmesis and is another potential site of incisional hernia.*

*We operated on a 57 year old female patient who presented with right periumbilical incisional hernia. Single incision laparoscopic dual mesh repair was performed: a single 2,5 cm incision was made, at the level 2 cm above umbilicus in left anterior axillary line. We used 10 mm optical trocar (angled camera with a working port) and one 5 mm trocar placed 1 cm cranially from the optical port. Operation was without complications, operating time being 65 minutes. Postoperative recovery was uneventful.*



*We report, what is to our knowledge, the first experience with single incision laparoscopic incisional hernia repair. Based on this and our previous experiences with SILS we believe that SILS incisional hernia repair is feasible in selected patients and that this approach should have less morbidity compared to other approaches. It remains to be compared with standard laparoscopic incisional hernia repair in terms of patient recovery, reduction of postoperative pain, complication rate, recurrence rate and port site hernia.*

**Key words.** *Single incision laparoscopic surgery, postoperative, incisional hernia, mesh repair, recurrence*

## Izveček

Tehnološki napredek je prinesel hiter porast števila laparoskopskih operacij skozi en rez (SILS). V sklopu posegov SILS smo uvedli tudi operacijo incizijske hernije skozi en rez. Glavni argument za uporabo tega pristopa je v tem, da predstavlja vsak rez in uvajanje troakarja tveganje za krvavitev, poškodbo organov in slabši kozmetični videz ter pomeni potencialno mesto za nastanek incizijske kile.

Predstavljamo primer 57-letne pacientke, ki smo jo operirali zaradi desnostranske periumbilikalne incizijske kile. Uporabili smo laparoskopski poseg z uporabo mrežne krpe (double mesh) skozi en rez. Rez v dolžini 2.5 cm smo naredili 2 cm nad popkom v levi sprednji aksilarni liniji. Uporabili smo 10-milimetrski troakar za optiko (delovni troakar za kotno optiko s kamero) in še en 5-milimetrski troakar, ki smo ga uvedli 1 cm kranialno od prvega. Operacija je potekala gladko in je trajala 65 minut. Pooperativni potek je bil brez zapletov.

Po podatkih, ki so nam na voljo, je bila to prva laparoskopska operacija incizijske kile skozi en rez. Na osnovi rezultatov tega pristopa in na osnovi prejšnjih izkušenj s tehniko SILS, menimo, da je tovrstni operativni poseg izvedljiv pri izbranih pacientih z incizijsko kilo in da bi i morala biti pogostnost zapletov pri tej tehniki manjša kot pri standardni operaciji. Potrebna bo še primerjava novega pristopa s standardno laparoskopsko operacijo incizijske kile in sicer glede hitrosti okrevanja, pooperativnih bolečin, števila zapletov in pogostnosti recidivne kile na vstopnem mestu troakarja.

**Ključne besede.** Laparoskopska operacija skozi en rez, pooperativni, incizijska kila, uporaba mrežne krpe, recidiv.

## Introduction

Incisional hernia is a frequent complication of abdominal surgery and has been reported after midline laparotomy in more than 20% cases (1, 2). High incidence and considerable percentage of recurrence is proportional to number of surgical repair options which means that unfortunately not one single solution proved superior to others. However, using mesh repair in incisional and ventral hernia repair results in lower recurrence rate compared with primary suture techniques (3). Advantages of laparoscopic approach add further reduction of total complication rate and fewer mesh infections. Most importantly, report-

ed hernia recurrence rate is significantly lower in laparoscopic approach than in open ventral hernia repair. This remains to be confirmed with long term follow up results.

Advancement in laparoscopic surgery introduced two main directions: natural-orifice transluminal endoscopic surgery (NOTES) and single incision laparoscopic surgery (SILS). Both are striving to improve already established benefits of laparoscopy and its ideal - no scar surgery. Reduced number of incisions, which decreases morbidity of bleeding, incisional hernia, organ damage and improves cosmetic result, is fulfilled in both approaches.



Operations eligible for NOTES approach are determined by the availability of entry point or hollow organ, availability of endoscopic instruments and occasional necessity for hybrid or laparoscopic assistance. SILS on the other hand enables the application of wide range of already existing instruments implying lesser learning curve, lower costs and avoids the penetration through the hollow organ which is associated with additional complications.

SILS laparoscopic appendectomy (4) and cholecystectomy (5) were first described in 1998. Recognised again by Hirano et al. in 2005, who used this approach in urology (6). The time gap could be explained by the lack of technical support. Trocars modified for adjacent placement, special multilumen ports that allow simultaneous multiple instruments insertion, gelports, articulating and bent instruments as well as adjusted laparoscopes are now commercially available. Herein we describe, SILS incisional hernia repair as another method of incisional hernia repair.

## Case report

A 57 year old female patient presented with post-operative incisional hernia, on the right side of the umbilicus, hernia neck being 4 cm in diameter. Six years earlier she had endocholecystectomy for symptomatic cholecystolithiasis. Two years ago choledochojejunal bypass (Roux) was formed for choledolithiasis and superposed stenosis of the choledochus.

Laparoscopic SILS incisional hernia repair was performed under general anaesthesia. Standard antibiotic prophylaxis was administered. Patient was placed in a supine position with a 10° to 15° Trendelenburg tilt with the arms resting against the body. Veress needle was inserted in left subcostal space. Carbon dioxide was insufflated to a pressure not exceeding 12 mmHg.

A single 2,5 centimeters skin incision was made, at the level 2 centimeters above umbilicus in left anterior axillar line. A 10 mm port was inserted under camera guidance (Figure 1). One 5mm port was placed 1 cm cranially from the optical port within the same skin incision (Figure 2). We used 0 degree angled camera with a working port (Video telescope 'OP EndoEYE', 10 mm, 0° direction of view, WA50120A, Olympus, Ishikawa, Tokyo, Japan).



**Figure 1**  
Angled camera with the working port



**Figure 2**  
Placement of trocars



**Figure 3**  
Single incision



Hernia was easily shown on insufflation. There were abundant adhesions, containing jejunum loops, to the anterior abdominal wall which were dissected. After preparation of the field, we inserted Gore-Tex mesh 10x10 cm (Dual Mesh, W.L. Gore & Associates, Flagstaff, AZ, USA). Fixation to the abdominal wall was performed by absorbable tucks (AbsorbaTack(TM) 5 mm Hernia fixation, Covidien, Mansfield, MA, US), with distance from hernia neck opening being 2 cm. The operation went without complications and the operating time was 65 minutes (Figure 3). Postoperative recovery was uneventful. Patient was discharged after 48 hours.

## Discussion

The technique for effective laparoscopic incisional hernia repair was introduced in 1992 (7). Benefits of laparoscopic technique over open technique repetitively stress reduction of postoperative pain, discomfort, shorter hospital stay and earlier return to work (8,9,10). Henifort et al. in a series of 407 patients completed the operation laparoscopically in 98.1% of patients in whom it was attempted and concluded that the complication rate was acceptable (11). Furthermore, laparoscopic approach has reduced recurrence rates from a range of 25% to 52% to a range of 3.4% to 9% confirmed in 6 years follow up study by Eid et al.(12). Long term studies remain too scarce to be conclusive. Another issue is the 3% incidence of port site incisional hernia in case of laparoscopic incisional hernia repair which should not be disregarded (13). Reduction of incisions to a minimum and careful closure respecting the layers of that incision should reduce port site hernia rate. All the benefits of laparoscopy in incisional hernia repair are conserved.

A possible explanation for recurrence rates in patients with incisional hernias which cannot be further reduced by variations in approaches is tissue collagen deficiency. This might also explain the superiority of mesh repairs to other hernioplasties. Meshes can be placed both, by dissecting the peritoneum and placing the mesh extraperitoneally, suturing the peritoneum at the end, or by placing the mesh on the peritoneum (14). Both techniques have comparable results with regards to low rate of conversion to open surgery and recurrence rate. Based on these premises

we tried the approach with minimal number of incisions and dual mesh placement, for its technical simplicity.

Even though reduction from three to one incision does not strike as a clear benefit, Bisgaard et al. (15) reported lower morbidity in group of patients in whom they performed laparoscopic cholecystectomy with downsized trocars in first week. On the other hand angulation issues are solved by choice of instrument - in our case we chose the combination of angulated camera with working port and another working port. Nevertheless, we recommend the procedure to be performed by an experienced laparoscopic surgeon.

This is to our knowledge, the first reported experience with single incision laparoscopic incisional hernia repair. There is an ongoing series of SILS TEP repairs at our institution (16). Based on these experiences we believe that SILS incisional hernia repair is a feasible technical solution for incisional hernia repair. Further studies are needed to evaluate patient's recovery, reduction of postoperative pain and complications in comparison to standard laparoscopic incisional hernia repair.

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