

Pregnancy Following Laparoscopic Mesh Repair of Ventral Abdominal Wall Hernia

Ernst Schoenmaeckers, MD, PhD, Vincent Stirler, MD, Johan Raymakers, MD, Srdjan Rakic, MD, PhD

ABSTRACT

Background: There are no data on laparoscopic repair of ventral and incisional hernias (LRVIH) in fertile women who intend to have further pregnancies. A unique series is described of 8 women who got pregnant and gave birth after LRVIH.

Methods: Medical records of 875 consecutive patients who underwent LRVIH were reviewed. Women who gave birth after LRVIH were identified. At follow-up, patients answered a questionnaire on pain, discomfort, recurrence, and problems during pregnancy and delivery and underwent a physical examination.

Results: Eight patients were identified; all agreed to inclusion. Four women received LRVIH for incisional hernia; 4 were operated on for primary ventral hernia. Median age at LRVIH was 29 years (range, 24 to 34). No postoperative complications occurred. Median time between LRVIH and delivery was 22.5 months (range, 12 to 44). Median follow-up after delivery was 23.5 months (range, 2 to 40). Five patients experienced a tearing pain in the area of hernia repair during the last months of pregnancy. This pain was not continually present and disappeared after delivery in all patients. All infants were born healthy at full term. Seven patients had a vaginal birth and one had a caesarean delivery. There were no major complications during pregnancy or delivery. At control examination, all patients were asymptomatic and, with one exception, without signs of recurrence. One patient had a swelling in the repaired area indicating either recurrence or mesh bulging. Being asymptomatic, she refused any further diagnostics.

Conclusion: LRVIH in fertile women who intend to have further pregnancies is an acceptable therapeutical option that causes no significant problems during pregnancy or delivery.

Key Words: Ventral hernia, Laparoscopic repair, Pregnancy, Mesh, Fertile age.

INTRODUCTION

Available data on treatment strategies for anterior abdominal wall hernias in women of childbearing age are scarce. No “best practice” guidelines exist. This is probably because the majority of women have these hernias repaired after the childbearing age.¹ However, “watchful waiting” in ventral abdominal wall hernias before pregnancy is not entirely benign. Clearly, a repair should be seriously considered at least in symptomatic patients and if the risk of incarceration of an untreated hernia seems to be present. Data regarding laparoscopic repair (LR) in this patient category are nearly completely missing. Altogether, a Medline/Embase search revealed only one case report on LR of hernia during pregnancy² and one case report on a patient with a successful vaginal delivery after previous LR of an omphalocele.³ We describe a unique series of 8 women who got pregnant and gave birth following laparoscopic repair of ventral or incisional hernia (LRVIH).

PATIENTS AND METHODS

Medical records of all 875 patients who underwent LRVIH at the ZGT Hospital Almelo, The Netherlands, between January 2000 and April 2011 were reviewed. Female patients between 18 and 45 years of age at the time of LRVIH were identified and contacted by telephone. All women who experienced childbirth after LRVIH were asked to come to our outpatient clinic for a physical examination and to answer a questionnaire on pain, discomfort, recurrence, and problems during pregnancy and delivery.

Surgical Technique

LRVIH was performed using an expanded polytetrafluoroethylene mesh (ePTFE; DualMesh, WL Gore & Associ-

Department of Surgery, Hospital Group Twente (ZGT), Almelo, The Netherlands (all authors).

Presented as a poster presentation at the 32nd International Congress of the European Hernia Society, Istanbul, Turkey, October 6-9, 2010.

NOTE—Missing Fax number here, Requested of Author 2/20/12.

Address correspondence to: EJP Schoenmaeckers, Jan Ligthartplein 51, 3706VE Zeist, The Netherlands. Telephone: +31-641188526, E-mail: eschoenmaeckers@gmail.com

DOI: 10.4293/108680812X13291597716104

© 2012 by JSLS, *Journal of the Society of Laparoendoscopic Surgeons*. Published by the Society of Laparoendoscopic Surgeons, Inc.

ates, Flagstaff, AZ) tailored to overlap all hernia margins by at least 3cm. No attempt was made to approximate the edges of the hernia opening. The mesh was fixed either by the double crown (DC) technique or with tacks along the periphery of the mesh and transabdominal sutures (TAS) placed equidistant along the edge of the mesh.

Data were collected in an Excel 2007 database and statistical analyses were performed using Statistical Package for Social Sciences for Windows (SPSS Inc., Chicago, IL, USA).

RESULTS

Eight women who gave birth to at least one child after LRVIH were identified, and all agreed to return for an interview and physical examination. All patients had symptomatic ventral abdominal wall hernias before the operation (**Table 1**). Four patients were operated on for an incisional hernia. Two incisional hernias were caused by a Pfannenstiel incision for caesarean delivery, one incisional hernia was a trocar-site hernia after laparoscopic cholecystectomy, and one incisional hernia was in fact a recurrent epigastric hernia that was treated earlier by open primary suture correction.

Prenatal ultrasound examinations performed by gynecologists did not mention the presence of mesh.

Median age at LRVIH was 29 (range, 24 to 34). Median operating time (skin-skin) was 44.5 minutes (range, 39 to 76). No complications occurred during surgery or postoperatively.

The median time between LRVIH and first delivery after LRVIH was 22.5 months (range 12 to 44 [**Table 2**]). Median follow-up after surgery was 46 months (range, 19 to

72). Median follow-up after first delivery after LRVIH was 23.5 months (range, 2 to 40).

One woman was admitted to the hospital twice during pregnancy for pain in the abdominal wall obviously related to her previous LRVIH. This pain was treated with oral analgesics and did not further complicate her pregnancy.

No major complications were encountered during pregnancy or during delivery. All children were born in good health and did not require hospital admission. Four women gave birth at home with a midwife (home delivery is common practice in The Netherlands), the other 4 women gave birth in the hospital. In the patient who underwent a C-section twice after LRVIH, the first C-section was performed through the mesh that was later on closed with an unabsorbable running suture. The second C-section was performed caudally of the mesh therefore not compromising the mesh.

All infants were born at full term (born anytime after 37 completed weeks of gestation through 42 completed weeks of gestation).

At follow-up interview, all women confirmed that preoperatively they had received extensive information about dilemmas related to the repair as well as therapeutical options. All of them had opted for LRVIH and had provided informed consent. Five women (63%) remembered a "tearing" or "pulling" pain at the area of previous repair during the last months of pregnancy, of an intensity of 50 or more on a visual analogue scale (scale 0 to 100). This pain disappeared immediately after delivery in all patients. All women (n=6) who had given birth before and

Table 1.
Baseline and Operative Characteristics

Patient Number	Hernia Type	Age at Surgery	Surgery Time (minutes)	Mesh Size	Fixation Method
1	Epigastric	34	42	10x15cm	DC
2	Umbilical	29	47	8x12cm	T&TAS
3	Epigastric	30	58	10x15cm	T&TAS
4	Incisional	30	34	10x15cm	DC
5	Umbilical	29	39	10x15cm	DC
6	Incisional	26	70	10x15cm	DC
7	Incisional	25	39	8x12cm	T&TAS
8	Incisional	24	76	10x15cm	T&TAS

DC=double crown of tacks, T&TAS=tacks and transabdominal sutures.

Table 2.
Follow-up Characteristics

Patient Number	Children Before LRVIH ^a	Children After LRVIH ^a	Delivery Type	Months LRVIH ^a -Birth	Abdominal Wall Pain During Pregnancy	Recurrent Hernia
1	1	1	Vaginal	23.4	No	No
2	1	1	Vaginal	39.8	Yes	No
3	1	1	Vaginal	20.0	Yes	No
4	1	2	Caesarean Delivery	12.4	No	No
5	2	1	Vaginal	13.4	Yes	No
6	0	2	Vaginal	12.1	Yes	Yes
7	1	1	Vaginal	44.4	Yes	No
8	0	1	Vaginal (with vacuum extractor)	30.6	No	No

^aLRVIH=laparoscopic repair of ventral or incisional hernia.

after LRVIH mentioned more pain in the abdominal wall during pregnancy after LRVIH than during pregnancy before LRVIH. All women returned completely to their daily activities as before delivery, with the exception of one woman who gave birth 2 months before our follow-up examination. None of the patients experienced chronic pain in the repaired area (mean VAS 15).

At follow-up examination, one patient had a swelling in the area of previous LRVIH, probably due to a recurrence of an incisional hernia or bulging of the mesh. Being entirely asymptomatic, she did not want further diagnostics or treatment.

DISCUSSION

Traditionally, there exists a reluctance to repair hernias in young fertile women, because of the possible disadvantageous impact on pregnancy, and possible association with a high risk of recurrence. Contrarily, no evidence exists to support “watchful waiting.” There are, however, scattered reports indicating that “watchful waiting” can be harmful when symptomatic hernias progress during pregnancy due to stretching of the abdominal wall. Progressive herniation causing incarceration of the gravid uterus or strangulation of bowel can cause pressure necrosis of the hernia wall, spontaneous rupture of the hernia, premature labor, abortion, intrauterine and maternal death.⁴⁻⁹ Indication for repair of a symptomatic ventral or incisional hernia in females of childbearing age should be considered to prevent the deleterious implications of herniation during pregnancy. With the aforementioned lack of evidence supporting either “watchful waiting” or repair, it is

up to the surgeon to construe the best approach on a case-by-case basis.

Weighing of various risks in establishing an indication for repair should also include the risk of symptomatic hernia recurrence during pregnancy, the risk of reoperation postpartum for a hernia recurrence, and the risk of hernia repair related complications during pregnancy. In addition, potential risks of repair for a future pregnancy, such as premature labor or preterm delivery, should also be considered.

In the only larger study on ventral hernia repair before pregnancy, Abrahamson and Gorman¹ reported a series of 27 women who underwent open sutured repair. Although they did not observe recurrences either during or after subsequent pregnancies or complications during pregnancies and deliveries, reservations regarding suture repair of even small hernias are well known, because of its very high long-term recurrence rate.¹⁰ It may be hypothesized that recurrence rates are not less after pregnancy. Reinforcement of primary suture repair with biological materials might be a very promising alternative, but studies on this issue are missing so far.

Repair of ventral abdominal wall hernias with synthetic mesh has become a “gold standard” in the general adult population. However, with the possibility of a future pregnancy in mind, there is a reluctance regarding implantation of synthetic mesh in the abdominal wall of the reproductive female. The foreign body reaction and scarring associated with mesh repair has in theory a potential to affect fertility and pregnancy. Given the expansion of the

abdominal wall during pregnancy, biomaterial characteristics of shrinkage and compliance should be considered. It has been previously shown that the flexibility of the abdominal wall may be restricted by large mesh implants.¹¹ However, so far there are actually no data indicating that mesh repair of symptomatic ventral hernias should be prohibited in the reproductive woman who desires future pregnancy.

Accepting that hernia repair with a larger mesh can have adverse effects on the physiology of the abdominal wall during pregnancy, we limited LR only to small hernias and used, consequently, small meshes for correction. Our experience indicates that this type of repair provides good long-term results causing no significant problems during pregnancy or at delivery. Two recent case reports describing laparoscopic mesh repair of ventral abdominal wall hernia either before² or during pregnancy,¹² to the best of our knowledge the only reports on this issue so far, reported similar observations.

However, all available literature regarding pregnancy after mesh repair, limited to a few case reports,^{3,12,13} and our own experience, indicate that pain is a significant problem associated with the mesh repair. This pain might occasionally require prolonged narcotic medications¹² or even intravenous "Patient-Controlled Analgesia."¹³ Observation that more pain is present at pregnancy after LRVIH than at pregnancy before LRVIH clearly confirms the role of hernia repair in the genesis of this type of pain.

The development of pain after LRVIH might be caused by the fixation of the mesh¹⁴ and the subsequent tension on this fixation during pregnancy. In this small series, the technique of mesh fixation (either double crown tack fixation or tacks and suture fixation) at LRVIH did not influence pain during pregnancy.

Results of this study indicate that LRVIH in fertile women who intend to have further pregnancies is an acceptable therapeutic option that causes no significant problems during pregnancy or delivery. It is clear that more investigation in this area of herniorrhaphy is needed.

References:

1. Abrahamson J, Gorman J. Pregnancy and ventral hernia repair. *Hernia*. 2000;4:187–191.
2. Wai PY, Ruby JA, Davis KA, Roberts AC, Roberts KE. Laparoscopic ventral hernia repair during pregnancy. *Hernia*. 2009;13(5):559–563.
3. Kim WB, Kim J, Boo YJ, Park SH, Song TJ, Suh SO. Successful vaginal delivery following laparoscopic abdominal reconstruction in an adult survivor of an omphalocele without prior surgical repair: report of a case. *Hernia*. 2009;13:431–434.
4. Chanana C, Malhotra N. Images in clinical medicine. Gravid uterus in an incisional hernia. *N Engl J Med*. 2007;356(15):e13.
5. Rao RS, Shankaragowda HS. A case of herniated gravid uterus through a laparotomy scar. *Indian J Med Sci*. 2006;60:154–157.
6. Deka D, Banerjee D. Incarcerated pregnant uterus in an incisional hernia. *Int J Gynaecol Obstet*. 2000;70:377–379.
7. Fullman PM. An incisional hernia containing an incarcerated twin pregnant uterus. *Am J Obstet Gynecol*. 1971;111(2):308–309.
8. Malhotra M, Sharma JB, Wadhwa L, Arora R. Successful pregnancy outcome after cesarean section in a case of gravid uterus growing in an incisional hernia of the anterior abdominal wall. *Indian J Med Sci*. 2003;57:501–503.
9. Seims AD, Lube MW. Incarceration of a sessile uterine fibrinoid in an umbilical hernia during pregnancy. *Hernia*. 2009;13:309–311.
10. Luyendijk RW, van 't Riet M, Hop WCJ, et al. A comparison of suture repair with mesh repair for incisional hernia. *N Engl J Med*. 2000;343–392.
11. Junge K, Klinge U, Prescher A, Giboni P, Niewiera M, Schumpelick V. Elasticity of the anterior abdominal wall and impact for reparation of incisional hernias using mesh implants. *Hernia*. 2001;5(3):113–118.
12. Mulder RJ, Stroobants WL, Roumen FJ. Pregnancy and delivery with an abdominal mesh graft. *Eur J Obstet Gynecol Reprod Biol*. 2004;116(2):235–236.
13. Aaen V, Cowan L, Sakala EP, Small ML. Prolonged parenteral meperidine analgesia during pregnancy for pain from an abdominal wall mesh graft. *Obstet Gynecol*. 1993;82(4 Pt 2 Suppl):721–722.
14. Wassenaar E, Schoenmaeckers E, Raymakers J, van der Palen J, Rakic S. Mesh-fixation method and pain and quality of life after laparoscopic ventral or incisional hernia repair: a randomized trial of three fixation techniques. *Surg Endosc*. 2010;24(6):1296–1302.