

# Subcutaneous endoscopic approach for ventral hernia repair with concurrent plication of rectus diastasis

*Enfoque endoscópico subcutáneo para la reparación de hernias ventrales con plicatura concurrente de diástasis de rectos*

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## Keywords:

rectus diastasis,  
ventral hernia,  
diastasis plication,  
endoscopic.

## Palabras clave:

diástasis de los  
rectos, hernia  
ventral, plicatura  
de la diástasis,  
endoscópica.

## ABSTRACT

**Introduction:** diastasis recti is a weakness of the alba line due to laxity in the aponeurosis that may be associated with abdominal wall hernias. When both are present, they must be surgically resolved. **Objectives:** to describe a minimally invasive subcutaneous technique for repairing ventral hernias with concurrent plication of rectus diastasis. **Material and methods:** this is a case series of seven patients between January 2019 and June 2020 who underwent endoscopic subcutaneous ventral hernia repair with concurrent diastasis recti plication. **Results:** the procedure was performed on seven patients, five men, and two women, with a mean age of 57.6 (38-70) years and a mean body mass index (BMI) of 26.7. The mean operative time was 174 (110-190) minutes. Hospital stays were two days. The mean defect size was 1.8 (1-2) cm, and the mean diastasis size was 3.5 (3-4) cm. After two weeks no postoperative complications (seroma, infection, hematoma). No recurrences have been reported in the medium-term follow-up (15 months). **Conclusion:** the subcutaneous endoscopic technique is a safe, reproducible, and effective alternative for patients with ventral hernias associated with rectus diastasis.

## RESUMEN

**Introducción:** la diástasis de los rectos es una debilidad de la línea alba debido a una laxitud en la aponeurosis que podría asociarse a hernias de la pared abdominal. Cuando ambas están presentes deben resolverse quirúrgicamente. **Objetivos:** describir una técnica mínimamente invasiva subcutánea para la reparación de hernias ventrales con plicatura concurrente de diástasis de los rectos. **Material y métodos:** ésta es una serie de casos de siete pacientes entre enero de 2019 y junio de 2020 que se sometieron a una reparación de hernias ventrales subcutáneas endoscópicas con plicatura concurrente de diástasis de los rectos. **Resultados:** el procedimiento se realizó en siete pacientes, cinco hombres y dos mujeres, edad media de 57.6 (38-70) años, índice de masa corporal (IMC) medio de 26.7. Media de tiempo operatorio de 174 (110-190) minutos. Estancia hospitalaria de dos días. Media del tamaño de los defectos 1.8 (1-2) cm, la media del tamaño de la diástasis 3.5 (3-4) cm. A las dos semanas no se reportaron complicaciones postoperatorias (seroma, infección, hematoma). Al seguimiento a mediano plazo (15 meses) no se han reportado recidivas. **Conclusión:** la técnica endoscópica subcutánea es una alternativa segura, reproducible y efectiva para pacientes con hernias ventrales asociadas con diástasis de los rectos.

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Received: 05/16/2020  
Accepted: 12/23/2022



## INTRODUCTION

Diastasis recti (DR) is caused by the reduction of the cross-linked fibers that form the alba line of the abdominal wall with an increase in their length, generating a

separation of both aponeuroses of the rectus abdominis muscles. This separation may present a laxity in the aponeurosis associated with abdominal wall hernias.<sup>1,2</sup> It is defined as the separation of the muscular borders of the midline greater than 2.2 cm;<sup>2</sup> it is not an

**How to cite:** Díaz DA, Gordillo AC, Viteri DF, Delgado JA. Subcutaneous endoscopic approach for ventral hernia repair with concurrent plication of rectus diastasis. Cir Gen. 2022; 44 (2): 67-72. <https://dx.doi.org/10.35366/109714>

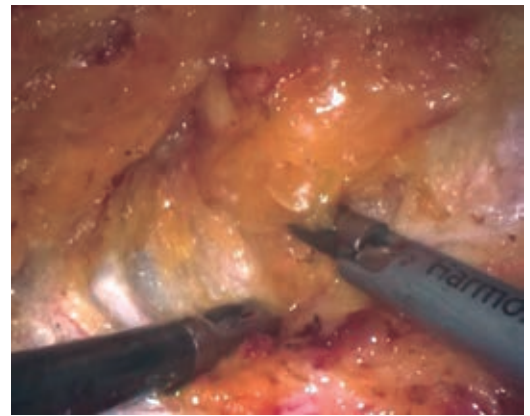
uncommon condition and occurs more often in women.<sup>3</sup> Diastasis per se is not associated with symptoms such as pain, discomfort, or any complication; the main complaint is aesthetic. There is currently no consensus on the type of approach for surgical repair of DR; however, since it is associated with midline hernias, correction of both pathologies could be the best indication.<sup>2</sup>

Different surgical approaches have been described for treating DR with or without midline hernias for patients with excess skin or excessive weight loss; open surgery, laparoplasty, or laparoabdominoplasty with dermo lipectomy are the best options.<sup>4</sup> However, a scar from a large incision may give an unfavorable aesthetic result for patients without excess skin.<sup>5</sup> Minimally invasive techniques with rectus plication and midline hernia repair with mesh placement have been described.<sup>6</sup>

This study is aimed to describe a minimally invasive subcutaneous technique for repairing



**Figure 1:** Image of the marking of the hernial defects, the size of the diastasis recti, and the position of the endoscopic ports.



**Figure 2:** Dissection of the subcutaneous cellular tissue separating it from the anterior aponeurosis of the rectus with harmonic scissors.

ventral hernias with concurrent plication of rectus diastasis.

## MATERIAL AND METHODS

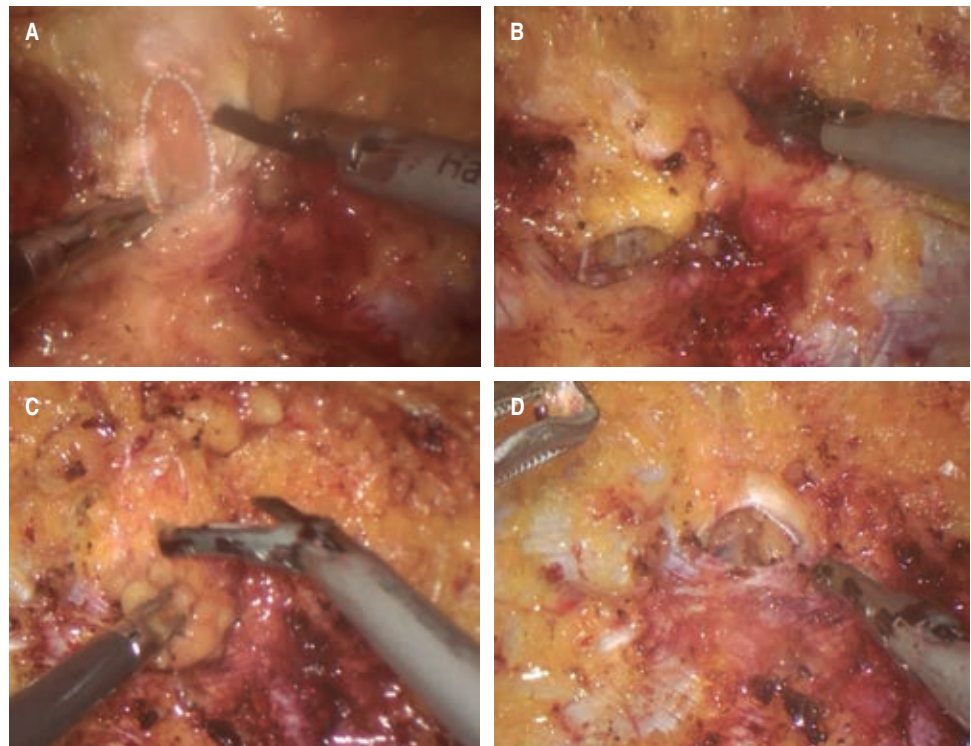
This is a case series at Hospital Quito No. 1 of the National Police general surgery service in Ecuador of seven patients between January 2019 and June 2020 who underwent endoscopic subcutaneous ventral hernia repair with a polypropylene mesh placement in the preperitoneal space and concurrent plication of diastasis recti. The procedure was indicated for patients with primary ventral hernias with concomitant diastasis recti. Patients with obesity, excess skin, a history of abdominoplasty, and coagulopathies were excluded.

### Surgical technique

Under general anesthesia, the patient is placed in dorsal decubitus in the extended lithotomy position. The limits of the extent of the dissection are marked (*Figure 1*). A transverse incision is made 1.5 to 2 cm above the pubis. Then, the subcutaneous tissue is dissected up to the anterior aponeurosis of the rectus abdominis; using digital dissection, the subcutaneous cellular tissue is separated from the aponeurosis superiorly and laterally to create an ideal space for the placement

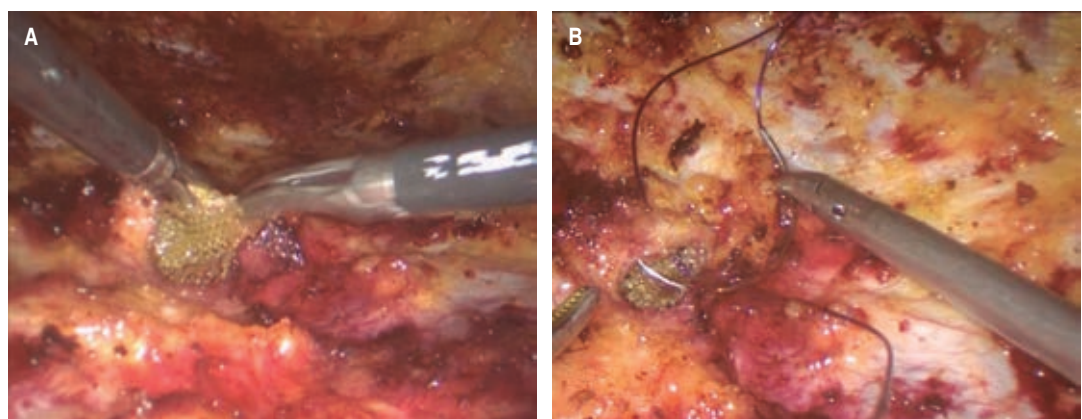
of an 11 mm port for the optics through the suprapubic incision and two 5 mm working ports in both lower quadrants (*Figure 2*). CO insufflation pressure<sub>2</sub> is maintained at 8-10 mmHg. Using harmonic scissors, subcutaneous dissection is performed from the suprapubic incision. The umbilicus is disinserted from the aponeurosis, and the dissection continued up to the xiphoid process

and laterally to the semilunar line (*Figure 3*). The defects are quickly identified, the hernial sac is dissected, and the contents are reduced to the abdominal cavity (*Figure 4*). Once the dissection is completed, the diastasis of the rectus abdominis muscles is easily identified (*Figure 5*). The mesh continues to be made according to the size of the defects and considers the principles of hernia repair. The

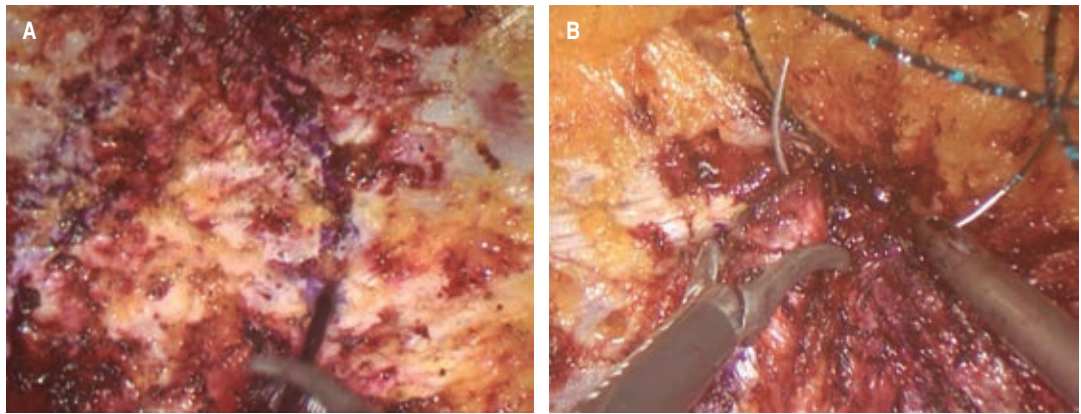


**Figure 3:**

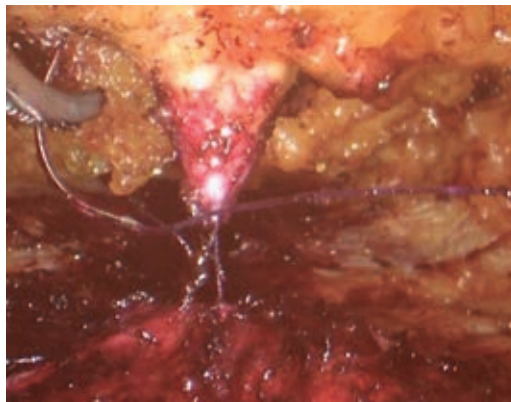
- A) Umbilical hernial sac (white lines). B) Umbilical hernial defect. C) Epigastric hernial sac. D) Epigastric hernial defect.*



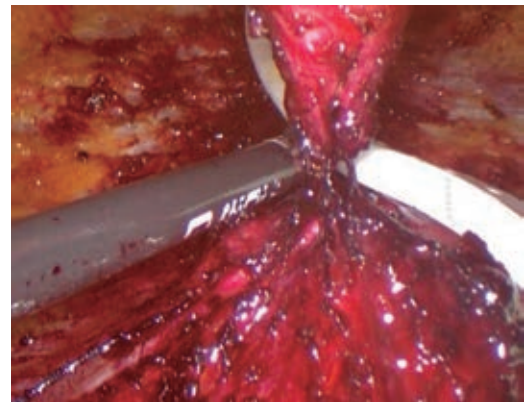
**Figure 4:** *A) Placement of the synthetic mesh in the preperitoneal space. B) Closure of the defect with a non-absorbable suture.*



**Figure 5:** A) Diastasis marking. B) Plication of the rectus abdominis muscles.



**Figure 6:** Reinsertion of the umbilicus.



**Figure 7:** Placement of drainage.

mesh is then placed in the preperitoneal space, and the defect is closed with a non-absorbable suture (Figure 4). The marking of the diastasis is continued, and the plication proceeds, which should extend from the xiphoid process to 2-3 cm below the umbilicus. In this case, barbed sutures were used and are recommended to facilitate plication without losing traction (Figure 5). The umbilicus is reattached to the muscular aponeurotic plane with one or two simple sutures (Figure 6). An aspiration drain is introduced to prevent seroma formation and is externalized through a 5 mm incision (Figure 7).

## RESULTS

The procedure was performed on seven patients, five men and two women, with a

mean age of 57.6 (38-70) years and a mean BMI of 26.7. The mean operative time was 174 (110-190) minutes. The hospital stay was two days. The mean defect size was 1.8 (1-2) cm, and the mean diastasis size 3.5 (3-4) cm. A postoperative girdle was placed after the procedure and maintained for 60 days. The drain was removed at 14 days with secretions < 20 ml/day. No postoperative complications (seroma, infection, hematoma) were reported at two weeks. During the medium-term follow-up (15 months), no recurrences were reported.

## DISCUSSION

Diastasis recti (DR) is defined as the excessive separation between the two bellies of the rectus

abdominis, which can occur at any point of the alba line, from the xiphoid process to the pubic symphysis.<sup>7</sup> DR is frequent and predominant in women, usually in pregnancy, and returns to its normal condition after delivery; however, after 12 months, one-third of these patients, still present it.<sup>7</sup> Hormonal changes cause changes in the tissues, producing tissue laxity at the level of the alba line, this hormonal effect persists up to three months after delivery, so if this condition persists at this time, it can be said that a DR exists.<sup>8</sup>

The association of midline hernias and DR is not uncommon; DR has been diagnosed in 45% of patients with small midline hernias (> 2 cm); of these patients, 31% who underwent suture repair had a higher recurrence compared to patients who had no association with a DR at a 30-month follow-up.<sup>9</sup>

The surgical indication remains controversial, and there is still no standard method for repairing midline hernias associated with DR. Several options for the joint treatment of midline hernias associated with DR have been described, ranging from open, laparoscopic, hybrid, or endoscopic techniques.<sup>5</sup> For obese patients and patients with excess skin, dermo lipectomy is the indicated method;<sup>10</sup> However, there are patients without excess skin in whom a pronounced scar may be an unfavorable aesthetic outcome. In these cases, the endoscopic option is a good alternative, as it presents several advantages, such as minimizing incisions, better esthetic results, less postoperative pain, and less wound infection.<sup>11</sup>

One of the main complications reported in some series is seroma, which has occurred in up to 27% of cases; in this series, no seroma has been reported. Several authors indicate that most seromas are spontaneously reabsorbed in > 50%, and drainage by puncture is the recommended technique in the seroma is not reabsorbed.<sup>2,3</sup> There is no indication of the drainage removal time and its production; however, in this series, the indication for removing the drainage was 14 days with secretions of less than 20 ml/day. In the 15-month follow-up, no recurrences have been reported.

## CONCLUSION

The endoscopic subcutaneous technique is a safe, reproducible, and effective alternative for patients with ventral hernias associated with rectus diastasis.

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**Ethical considerations and responsibility:** ethical considerations were taken into account with the patients, and we have their authorization to carry out this study.

**Financing:** no financial support was received for the realization of this work.

**Disclosure:** the authors declare no conflict of interest.

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