# Conservative Treatment Of Huge Abdominal Wall Hematoma After Laparoscopic Appendectomy: Report Of A Case

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## Citation

E López-Tomassetti, A Martín Malagón, I Artega, H Díaz, A Carrillo. *Conservative Treatment Of Huge Abdominal Wall Hematoma After Laparoscopic Appendectomy: Report Of A Case*. The Internet Journal of Surgery. 2004 Volume 6 Number 2.

#### Abstract

It is possible to perform many diagnostic and therapeutic procedures using minimally invasive techniques. Examination of the appendix is a new area where laparoscopy is being used.

These techniques require frequently insertion of small cylindrical tubes through the anterior abdominal wall at points lateral to the midline to enter the abdominal cavity. Abdominal wall vessel injuries may occur by these techniques although significant abdominal wall hematomas are rare. Commonly, it occurs when damage to an epigastric vessel during trocar insertion and usually have good prognostic.

Some recommendations may avoid, but not always, this type of accident. We report a case of a 30-years-old patient who presented with a huge abdominal wall hematoma sixty minutes after laparoscopic appendectomy. During intervention there was no sign of abdominal wall bleeding.

We concluded that trocar injury is a potentially preventable complication in laparoscopic surgery. Some recommendations may avoid, but not always, this type of accident.

## **CLINICAL CASE**

A 30 year-old male presented to the emergency room with abdominal pain accompanied by vomits and low fever beyond 12 hours after admission. He lost his appetite and felt nauseous.

Physical examination revealed lower right quadrant pain with involuntary guarding and rebound abdominal tenderness at Mcburney's point. He had 30 IMC. The rest were normal. Laboratory tests showed leukocytosis and neutrophilia. Coagulation and bleeding times were within the normal range. He did not have a past history of abdominal disease.

With diagnosis of appendicitis the patient underwent laparoscopic appendectomy.

The procedure was carried out in 30 minutes. No bleeding was manifested inside the abdomen and laparoscopic port cannulas were retired under direct camera vision without active bleeding through the port access.

The patient came out of operation room. Approximately one hour later he complained of severe abdominal pain on right trocar port without clinical response to opioid analgesics.

#### Figure 1

Figure 1: Abdominal wall hematoma after laparoscopic intervention. Arrows indicate trocar entry.



On abdominal exploration it was manifest abdominal wall hematoma (fig. 1) and ultrasonography was carried out to exclude intraabdominal bleeding. Ultrasonography revealed a contained hematoma (approximately 10 x 9 cms), surrounded by abdominal sheath muscles. No hemoperitoneum was present. At this moment it was decided a conservative treatment with antibiotics. It was considered ultrasound and CT-Scan to monitor the size and diagnose other potential complications (fig. 2).

# Figure 2

Figure 2: CT-Scan two days after operation showed a significant hematoma in the right abdomen (9 x 12 cms). No hemoperitoneum is present. There was no high-density area suggesting extravasation. Arrow showed hematoma localization.



The patient was discharged from hospital on day 10 with no fever and normal laboratory test. He continued on prophylactic antibiotics for 2 weeks.

3 months later he remained asymptomatic.

# DISCUSSION

There are numerous reports of serious, occasionally fatal, injuries from trocars. These injuries can result from a defect in the instrument or from errors in usage<sub>1</sub>.

Trauma to abdominal wall blood vessels occurs in 0,07 to 3,4% of laparoscopic procedures. Jansen reported 38 abdominal wall vessel injury in 25764 cases; rate: 1,5/1000<sub>2</sub>, and Chapron reported 20 in 29966 cases; rate 0,7/1000<sub>3</sub>.

The anterior abdominal wall is supplied by two sets of vessels. Most commonly injured vessel in laparoscopic procedures is the epigastric vessels. Superficial vessels arise from the femoral vessels as they emerge from the femoral canal. Deep epigastric vessels are branches of the external iliac vessels which arise just before the artery enters the canal and then course up on the undersurface of the rectus muscle.

Saber reported in a recent study based on CT scan mapping the superior and inferior epigastric vessels that epigastric vessels are usually located in the area between 4 and 8 cm from the midline. At the xiphoid level, the average distance of the epigastric vessels from the midline was approximately 4,5 cm on both sides. The epigastric vessels were 7,47 cm and 7,49 cm on the right side and left side, respectively, at the level of the symphysis. Staying away from this area, either medially or laterally, will determine the safety zone of entry the abdominal wall<sub>4</sub>.

Trocar insertion produce tissue trauma and may injured blood vessels of the abdominal wall. Usually, the superficial vessels on abdominal wall are clearly seen when the abdominal wall is transilluminated. Damage from deep vessels of the abdominal wall may be avoided with the laparoscope during trocar port entry.

During the operation damage may initially go unrecognized because of temporary tamponade by both the cannula and pneumoperitoneum. Bleeding may be manifested as oozing externally around the port site or dripping internally along the shaft of the cannula into the abdominal cavity.

In our case, the patient was stabilized hemodinamically and there were no signs of active bleeding. Also, hematoma was contained within the abdominal wall as shown in urgent ultrasonography so we decided conservative treatment. We avoid another intervention that would lost the advantages of minimally invasive surgery in appendectomy.

The risk of vessels injury during trocar access made necessary the search for a safe trocar system. Decrease of pain, ease of entry, firmly fascial seal and lower risk of herniation should be considered when performing a laparoscopic intervention. Ideal trocar should decrease tissue trauma and abdominal wall bleeding. Non-cutting trocar systems have been developed for this purpose.

Radially dilating trocar systems such as Step and Separator trocars has been described as the ideal trocar system. Bohm reported the rate of abdominal wall bleeding on Step procedures at only  $0.04\%_5$ .

Optical trocar permits direct vision while penetrating the different layers of the abdominal wall. Currently two systems of visible entry trocars are wide spread: Optiview

and Visiport. Vessels injuries can be reduced considerably if direct visualization at entry is used.

Although optical trocar permits direct vision through the layers of the wall they commonly are used for first trocar entry. Direct visualization of layers through optical trocar are not commonly used for secondary and other trocars placement.

## Figure 3

Table 1: Minimizing abdominal wall vessels injuries with trocars.

<ol> <li>Understanding the abdominal wall anatomy and distribution of blood vessels.</li> </ol>
<ol><li>Transilluminate abdominal wall in thin patients.</li></ol>
<ol> <li>Entering at right angles permits the pass through the lease amount o tissue.</li> </ol>
<ol><li>Smallest trocar possible to accomplish the operation.</li></ol>
<ol><li>New radially dilating trocar system (Step trocar) has shown on serie to diminished the trauma and bleeding to the abdominal wall.</li></ol>
<ol> <li>Optical trocar systems (Visiport, Optiview): trocar entry laceration can be reduced considerably if direct visualization at entry is employed.</li> </ol>

## CONCLUSION

Abdominal wall vessel injuries may occur by trocar entry. Trocar injury is a potentially preventable complication in laparoscopic surgery. Some recommendations may avoid, but not always, this type of accident.

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