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Is laparoscopy still needed in blunt abdominal trauma?

AE NICOLAU

- Trauma – main cause of death for people < 50 yo:
  - 3 millions / year
    - 40% in 1970 ⟶ 10% in 2000

- Death
  - imediat: 45%
  - early (hours): 20%
  - **delayed: 35% ⟶ sepsis; ARDS; MSOF**

[Garcia A et al. Surg Clin N Am, 2006]

Therapeutic principles

1. QUICK, COMPLETE DIAGNOSIS
2. THE ADECVATE TREATMENT
3. PREVENTION OF COMPLICATIONS

Spontaneous hemostasis in solid organs injuries (SOI)

UNNECESSARY LAPAROTOMIES

↑ morbidity and mortality

DELAYED LAPAROTOMIES

Missed lesions of the hollow viscus (HVI) , diaphragm , mesentery

Diagnostic modalities

Noninvasive	Minimally invasive	Invasive
Clinical examination US Rx CT-scan MRI	PLD angiography laparoscopy	laparotomy

In blunt abdominal trauma laparoscopy has a limited, controversial role in comparison with its role in penetrating abdominal trauma

Metaanalisis on laparoscopy in trauma

- **1976 patients in 37 studies**
- **Screening**: **indication of non-operative management or laparotomy**
  - **Accuracy: 88-100%**
- **Diagnostic (DL):** identification of all the lesions
  - **Sensibility:** 100%
  - **Specificity**: 91%
  - **Accuracy**: 96%
- **Missed lesions: 1%**
- **Complications**: **1%** (22p of 1672p)

Laparotomy was not necessary in 63% of the cases (1050/1661)

Limits of laparoscopy in trauma

- Identification of the hollow viscus injuries (HVI)
- Identification of the retroperitoneal lesions
- Trained medical personnel and adequate technical equipment
- Cannot be done for hemodynamic instable patients (?)
- It is expensive

[Villavicencio RT, Am Coll Surg, 1999]

Material and Method

- We searched on **www.ncbi.nlm.nih.gov** **Pub Med** all the published papers in the period 2000-2007 which had the keywords ***"laparoscopy and blunt abdominal trauma".***
- There were included all the papers that presented the role of laparoscopy in blunt abdominal trauma
- There were excluded the papers that included pediatric traumas, penetrating and iatrogenic lesions
- Based on the analyzed articles, the aim of the study was to identify the advantages, indications and contraindications of laparoscopy in HVI

Results

- We registered 100 articles from which we excluded 33
- **We analyzed 67 articles**
- **The level of evidence of the articles** was III with one exception, evidence level II

TITLE OF THE ARTICLE	No
Use of laparoscopy in abdominal traumas	5
Abdominal traumas, referring to laparoscopy	3
Laparoscopic approach in mono organ lesions in blunt abdominal trauma	14
'Review' articles	15
Guidelines (EAES,SAGES)	2
Case presentations	27

Published series of laparoscopic approach of blunt abdominal traumas (2000-2007)

Author	Country	No. cases	Missed lesions	TL*	Complications	HVMI**	Year
TANER	TR	28	-	-	-	2	2001
NICOLAU	RO	28	-	3	-	2	2002
MEYER	D	20	-	8	-	1	2002
CHELLY	USA	7	-	-	-	1	2003
CHOI	SC	52	-	49	-	45	2003
TOTAL		**135**	-	**60**	-	**51**	

*TL= therapeutic laparoscopy
**HVMI=hollow viscous and mesentery injuries

Laparoscopic approach of small bowel lesions (SBL)

Author	Country	No. cases	LT*	Missed lesions	Conversions	Complications	SBL
MATHONET	FR	42	5	0	10	0	15
MITUHIDE	J	18	0	0	7	0	7
OMORI	J	11	11	0	0	1	11
SINHA	I	5	5	0	0	0	5
TOTAL		**76**	**21**	**0**	**17**	**1**	**38**

*TL= therapeutic laparoscopy

Advantages (1)

- **Direct visualization of the visceral and parietal lesions**
- **Enhanced image**
- **Sensibility and specificity of 85-100% for the indication of laparotomy**
- The best diagnostic method for diaphragmatic lesions (occult)

Advantages (2)

- Can evaluate the **dynamic of hemorrhage**
- Can reveal the **HVI at the patients with indirect signs on the CT scan images and US**
- **Prevents unnecessary laparotomies**
- Improves the selection of the patients for nonoperative therapy (NOT) beside CT scan

Therapeutic laparoscopy

- **Hemostasis** (electric, LASER or chemical) for **hepatic and splenic superficial lesions (grade I/II)**
- **Hemostasis for mesentery or/and great omentum tears**
- **Phrenoraphy, gastroraphy, enteroraphy, coloraphy, cistoraphy**

- **Laparoscopic assisted or laparoscopic segmental enterectomy, Hartmann resection**
- Emergency or elective, laparoscopic or hand-assisted **splenectomy**
- **Laparoscopic colecistectomy for post-traumatic gallbladder injuries**
- **Distal pancreatectomy, peripancreatic drainage**

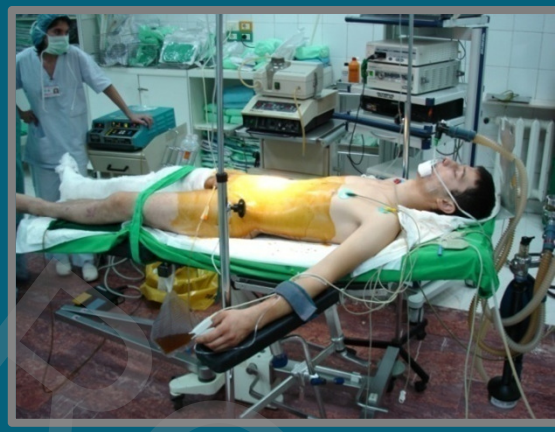
Contraindications

- Hemodynamic instability, multiple lesions, important bleeding, very severe lesions
- Severe cranio-cerebral traumatisms (GCS<11) in the absence of ICP monitoring
- Severe thoracic traumatisms with pulmonary trauma and/or severe miocardic contusions

- Existence of previous cardio-pulmonary pathology or decompensated hepatic pathology

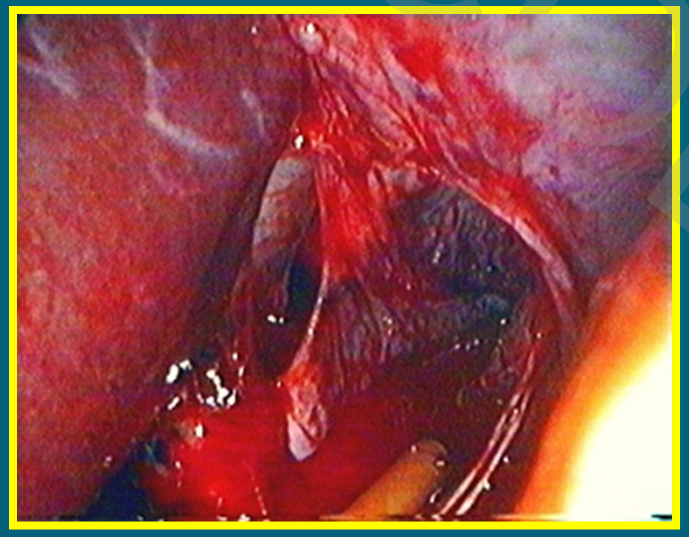
- Difficult access in the peritoneal cavity: postoperative tight adhesions, abdominal distension, pregnancy

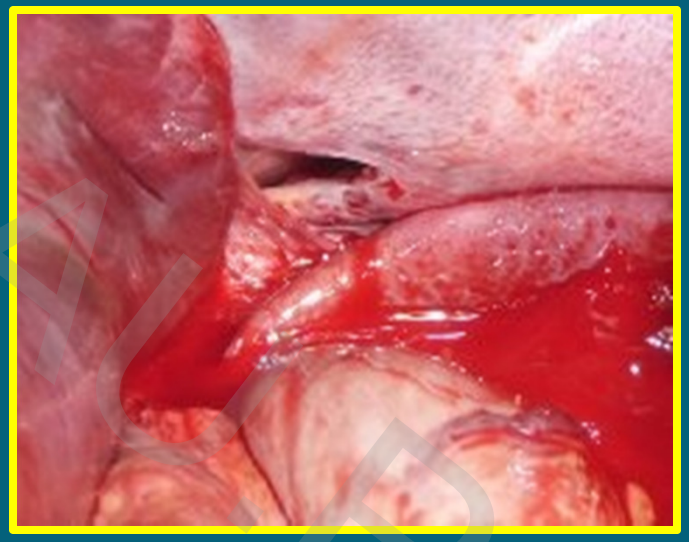
- Lack of experience, of the an adequate equipment, of an experienced anesthetic-surgical team, of a trained medical personnel

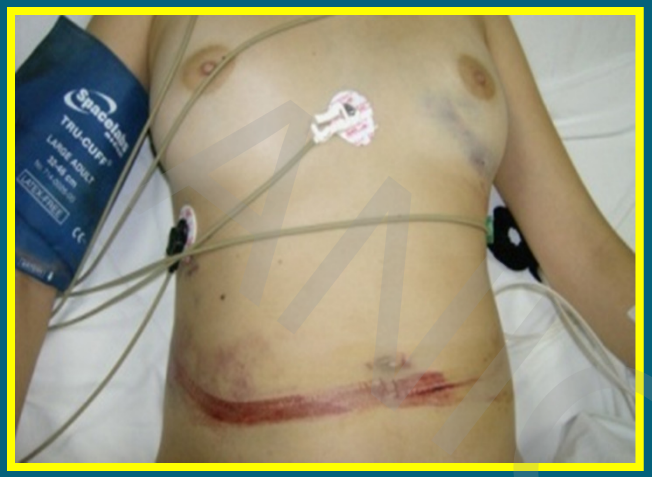


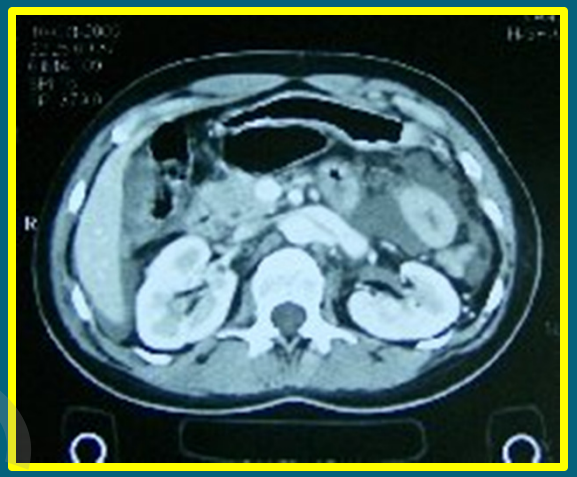
Indications

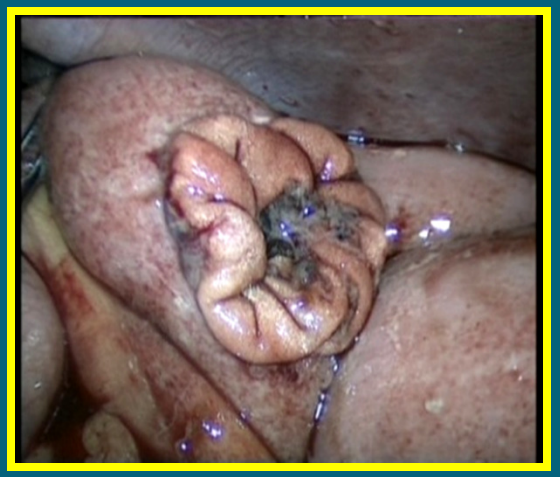
1. Suspicion of diaphragmatic lesions





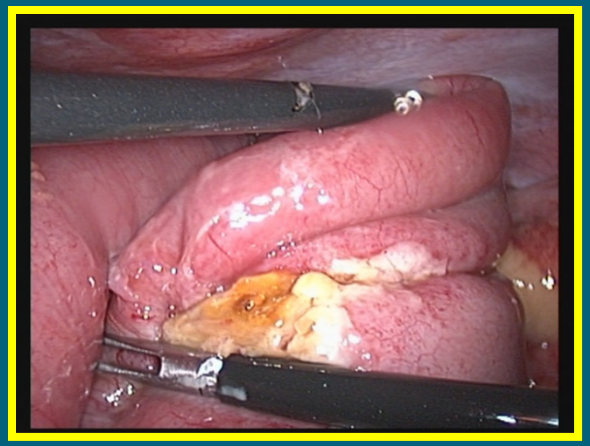


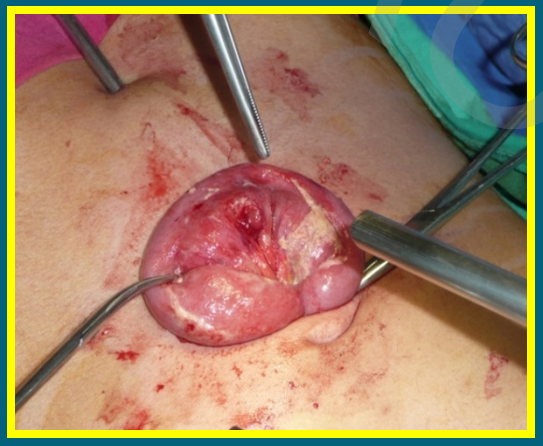


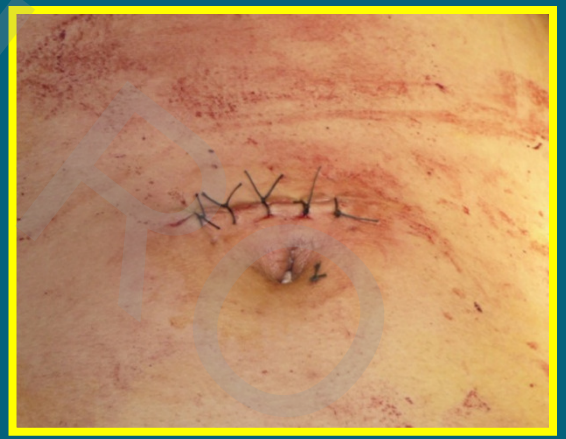


2.Suspicion of hollow viscus injuries

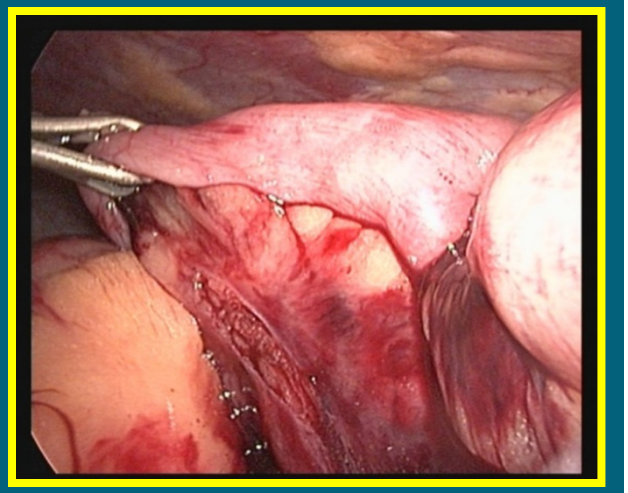
(!!! intraperitoneal liquid in the absence of solid organs injuries)



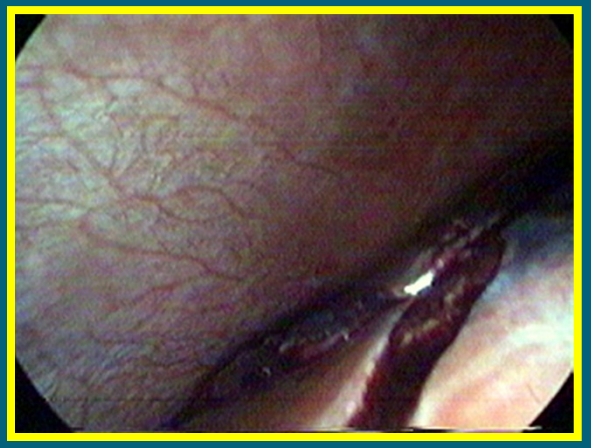


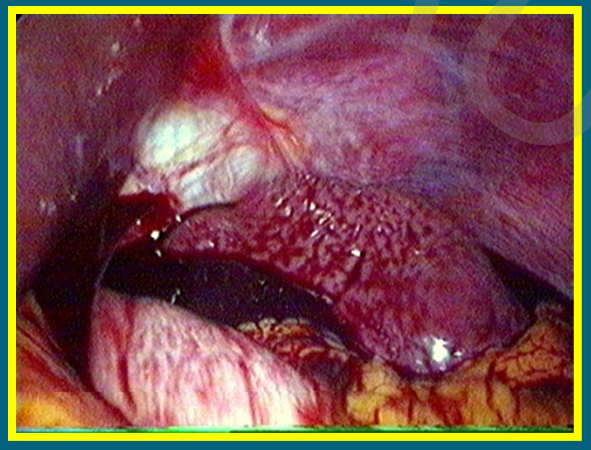


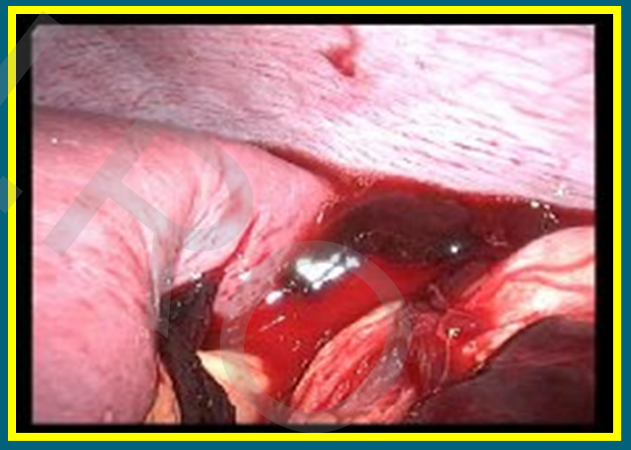
3. Suspicion of mesenteric lesion with possible small bowel necrosis



4. Hemoperitoneum determined by solid organ lesions or mesentery: **spontaneous hemostasis?**







5. Suspicion of hollow/solid organ lesions in polytrauma patients who require ETI for extraabdominal surgical interventions

6. Impossibility to do an emergency CT scan or US in some hospitals, but with the possibility of performing a safe DL

7. **Poor outcome of the patients with TNO and un unclear imagistic findings:** possible phrenic lession, peritoneal abcess, posttraumatic acute colecistitis, mesenteric ischemia, etc

CONCLUSIONS

- There is a small number of published articles regarding laparoscopy in blunt abdominal trauma, with a low level of evidence
- Laparoscopy is a therapeutic and diagnostic method less used in blunt abdominal trauma

- **Its main role is reducing the number of unnecessary or delayed laparotomies in the selected and suitable cases with unclear imaging investigations and clinical findings**

- **There are necessary multicentre prospective studies in order to establish the role of laparoscopy**

“In emergency, laparoscopy remains the last diagnostic tool and the first therapeutic mean.”

Thank you for your attention!

Algoritmul laparoscopiei diagnostice (LD) şi terapeutice (LT) în contuziile abdominale