

INDICATIONS AND OUTCOMES LAPAROSCOPIC SPLENECTOMY IN ABDOMINAL TRAUMA: 5-YEARS SINGLE OPERATOR EXPERIENCE FROM A LEVEL ONE TRAUMA CENTER



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INTRODUCTION

Non-operative management with angioembolization (AE) in haemodynamically stable splenic injuries is not always technically feasible or successful, it requires a strict patient conduct, it does not completely prevents delayed splenic rupture, has considerable costs, risks and complications. In addition it is not indicated in penetrating splenic injury requiring surgical exploration for diaphragmatic or hollow-viscus injuries.

In this setting, **laparoscopic splenectomy (LS) may be a good option instead of open splenectomy (OS), either as early or delayed procedure.** Nevertheless, LS is not widely accepted yet and only small case-series have been described in literature. Aims of the study were to investigate **indications, safety and feasibility of LS compared to OS in the management of stable traumatic splenic injuries.**

MATERIALS AND METHODS

- Retrospective observational study; **Jan 2013-Dec 2017**; Maggiore Hospital, Italy (**Level 1 Trauma Center**)
- Inclusion criteria:** all consecutive splenectomies (open or laparoscopic) in haemodynamically stable patients (ATLS class I or II-III responders)
- Exclusion criteria:** haemodynamic instability, transiently or not responders to resuscitation; septic shock; retroperitoneal injury at CT scan; contraindications to pneumoperitoneum (e.g severe head injury, cardio-respiratory failure)
- All the patients underwent a **contrast-enhanced CT scan upon admission**
- Indications to OS were given by **experienced trauma surgeons** who personally performed the procedures; LSs were performed by an experienced trauma surgeon with **advanced laparoscopic skills**
- Timing:** *Early* procedure: < 24 hours; *Delayed:* > 24 hours after admission
- Failed NOM (fNOM):** clinical/radiological findings that raised suspicion of a missed source control, delayed splenic rupture, not technically successful AE, complications of AE
- Descriptive analysis, per-protocol and an intention-to-treat analysis of OS and LS and for isolated splenic injuries

RESULTS

Indications to splenectomy	OS	LS
Early		
- Subcapsular hematoma	0	2
- Urgent spinal, pelvic or complex orthopedic surgery	1	6
- Mentally impaired patient	0	2
- Celiac trunk stenosis	0	1
- Penetrating splenic injury	0	1
- Splenomegaly	1	2
- Diaphragmatic injury	2	0
Delayed		
- Pseudoaneurisms after AE	0	4
- Persistent bleeding after AE	5	1
- Splenic infarction/abscess after AE	2	1
- Delayed splenic rupture	3	0
Surgeon's decision	17	0

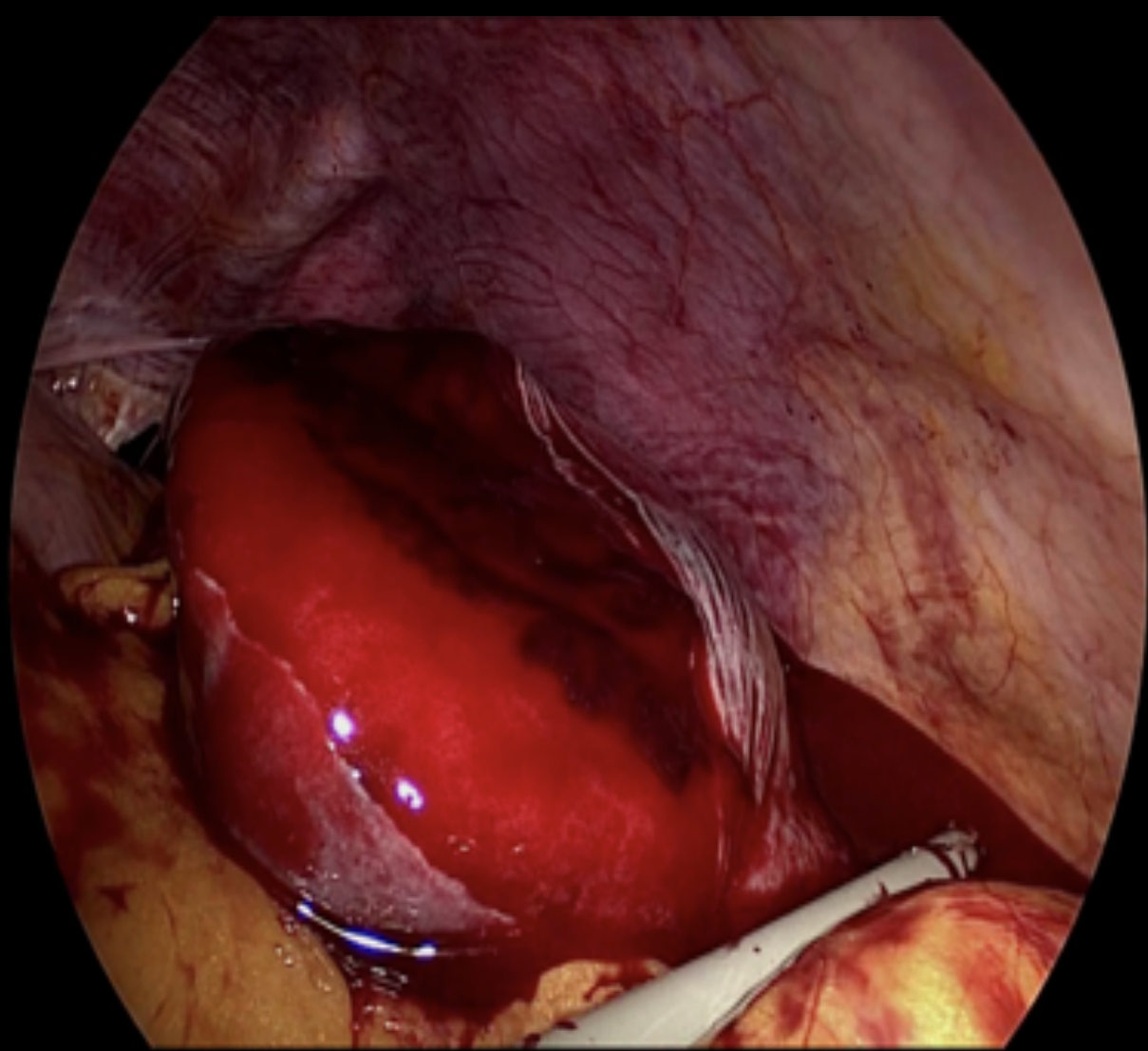
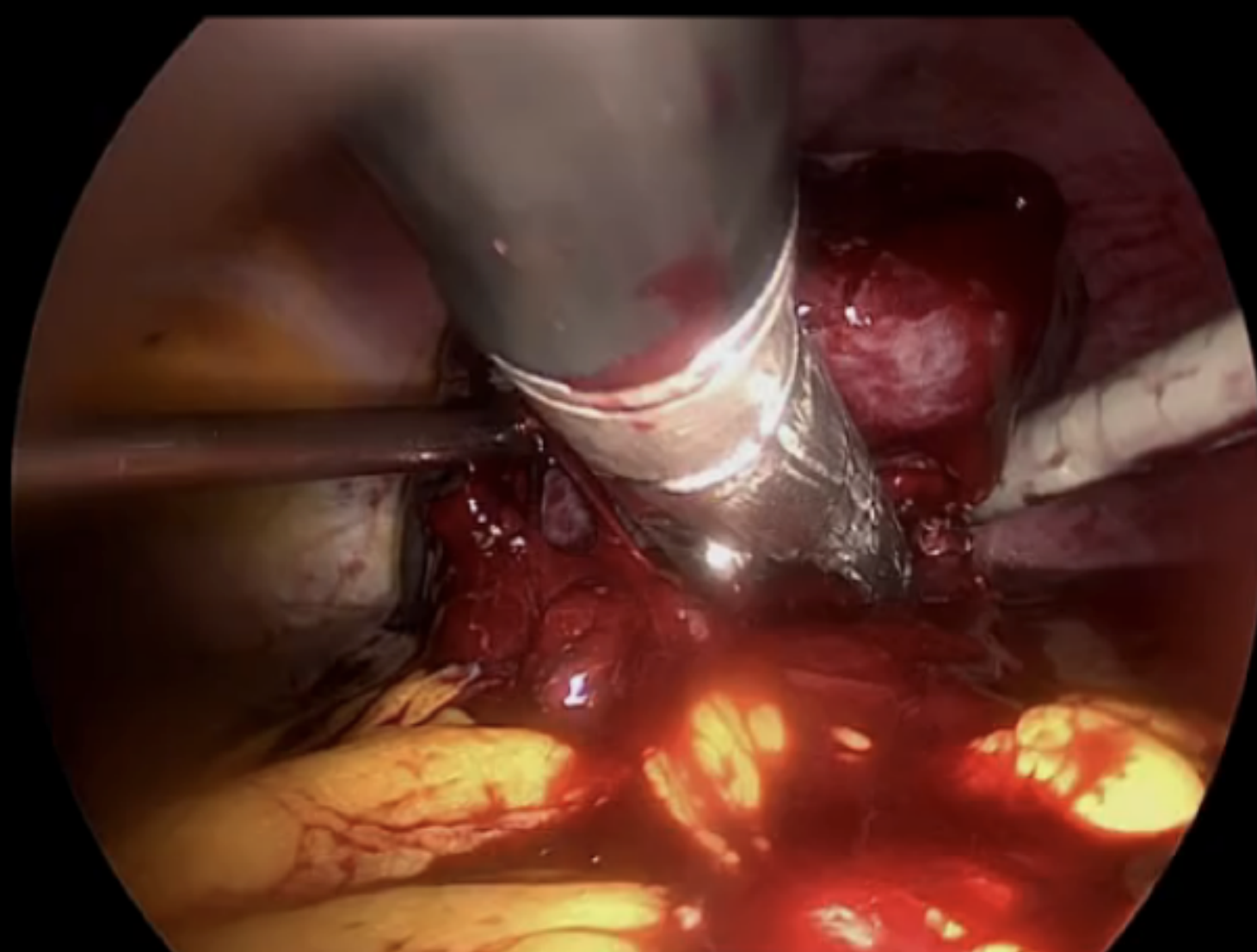
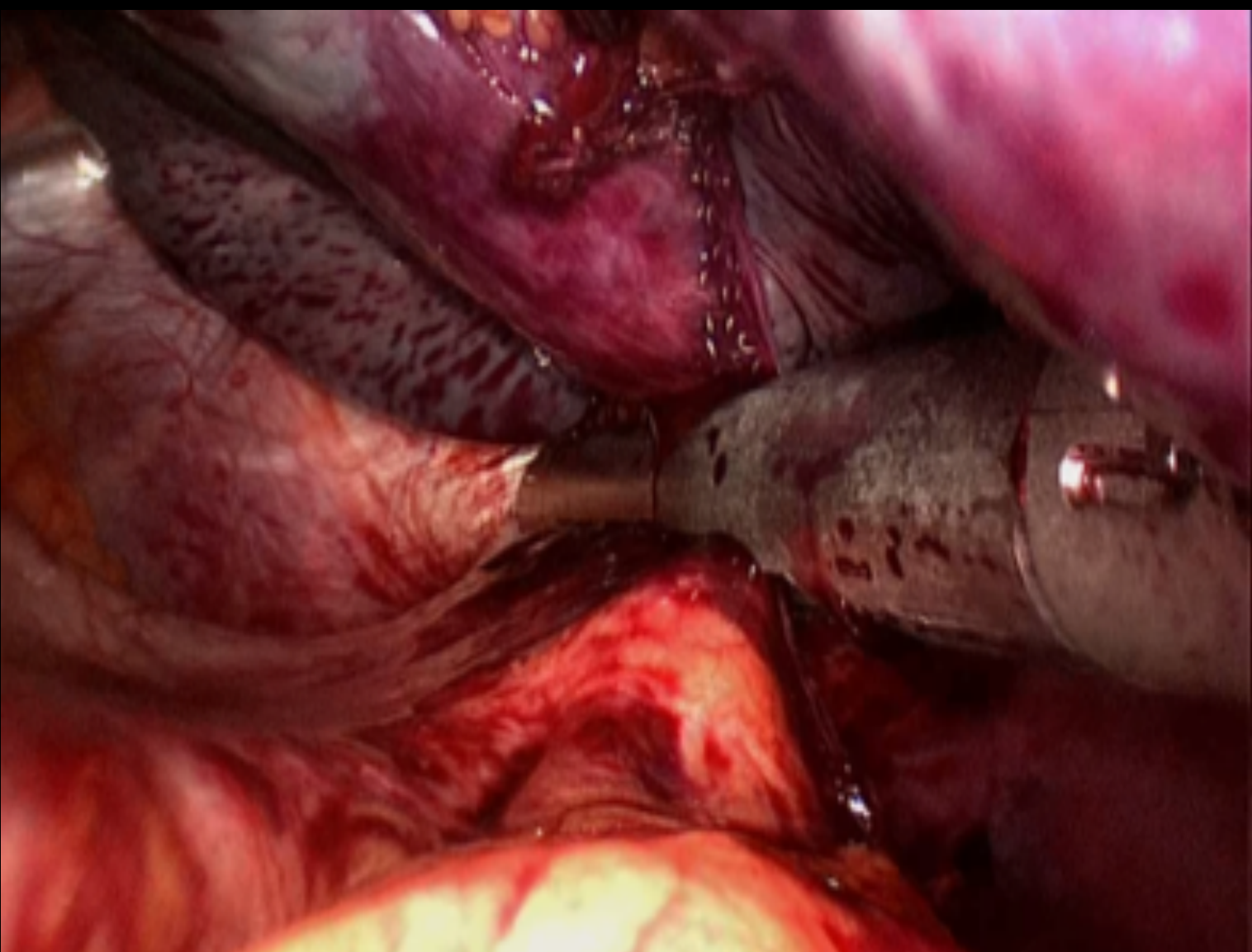
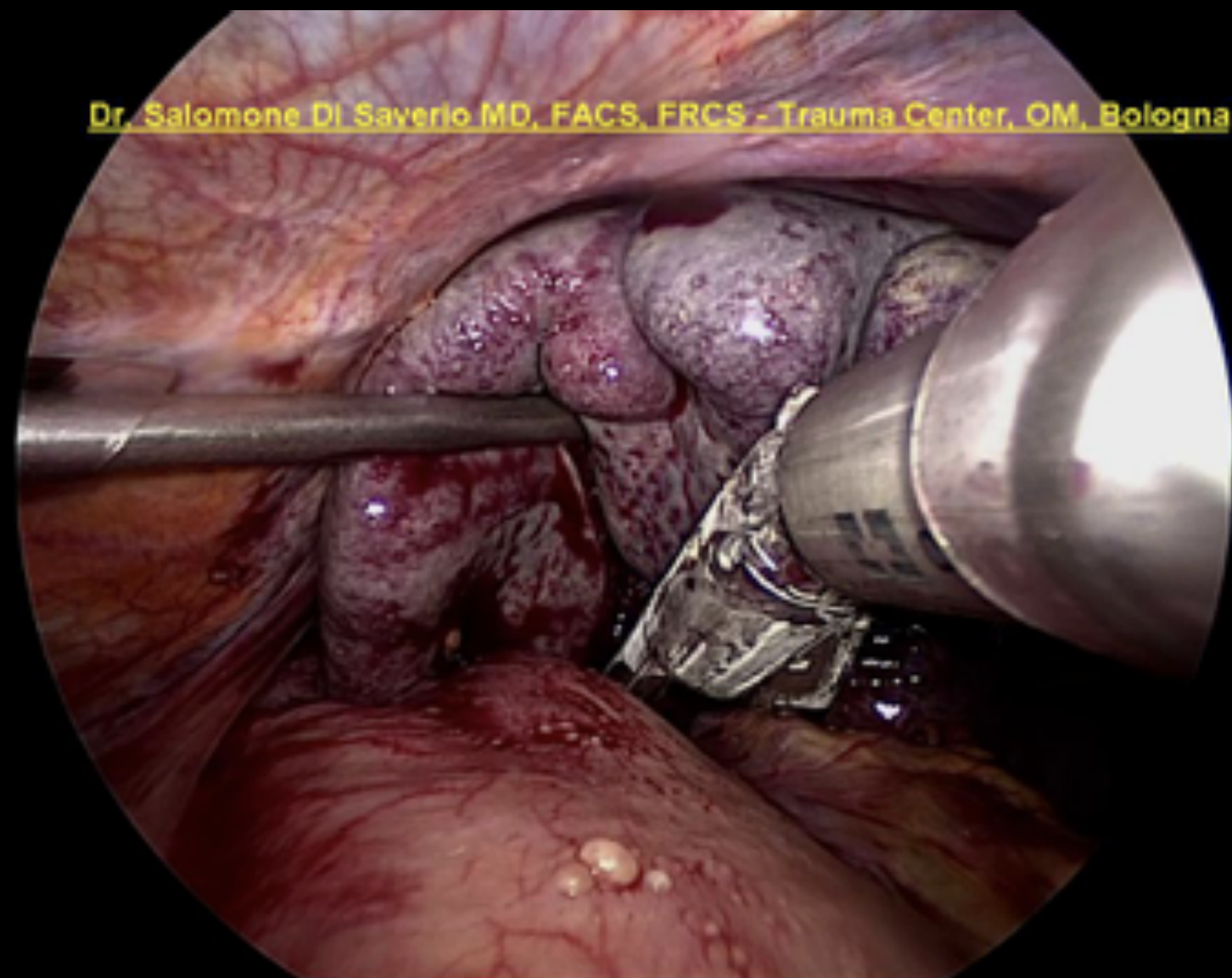
Indications to splenectomy (multiple indications are possible for each case) – open splenectomy (OS), laparoscopic splenectomy (LS).

Overall case series:

- 48 splenectomies, 32 (67%) OS vs. 16 (33%) LS; conversion rate 19% (3/16)
- No significant differences between the two groups baseline characteristics, included associated injuries, rate of fNOM, early and delayed indication.
- LS had a significantly higher rate of **associated surgical procedures (p=.021), longer ICU length of stay (LOS) (p=.049) and longer operating time (p<.0001), but faster bowel function recovery (p<0.0001)**
- No reoperation** required in the laparoscopic group.
- No significant differences in terms of post-operative morbidity, mortality, overall LOS and long-term complications between OS and LS.**
- LS had lower SSI (0 vs 21%, NS)

Isolated splenic injuries case series:

- 25 splenectomies, 19 (76%) OS vs. 6 (24%) LS; conversion rate 16% (1/6)
- No significant differences between the two groups baseline characteristics, rate of fNOM, early and delayed indication.
- LS had longer **operative time (p.00001)**, but reduced post-operative morbidity (40% vs 57%), blood transfusion (0 vs 42%), ICU admission (20% vs 53%), overall LOS (7 vs 9 days) and significantly **faster bowel function recovery (p<.05)**



CONCLUSIONS

- Although small numbers affected the achievement of full statistical significance, regardless of age, severity of trauma and presence of associated injuries (non-inferior morbidity and mortality and improved postoperative recovery), **in hemodynamically stable patients with splenic trauma not amenable to NOM, LS maybe a safe and effective technique and may represent a beneficial alternative to open splenectomy.**
- Advantages and safety of LS are to be ascribable to: level of expertise of the institution, availability of adequate laparoscopic equipment, highly-skilled laparoscopic trauma surgeons.**