Dr Simon K.H. Wong Chinese University of Hong Kong Medical Centre

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Past President, *Asia-Pacific Metabolic & Bariatric Surgery Society*

Dr Simon K.H. Wong Chinese University of Hong Kong Medical Centre (CUHK MC)

Pre-Congress Workshops
Early Career Fundamentals : Technical Expertise

Recognizing and Management of Unexpected Problems: Bleeding, Injury, Large Hiatus Hernia, Adhesions, Eschar

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Bleeding

Injury

Large Hiatus Hernia

Adhesions

Eschar

Others .....

Expect the Unexpected

Management of Unexpected Problems:

Foreseeable ?

something that takes you by surprise

Get prepare for surprise

Learn from Mistake

Bad things are going to happen ?

Get Prepared ; Get Help

Understand	Prevent	Manage
Bleeding		Stop the Bleeding
Injury		Repair the injury
Large Hiatus Hernia	?Repair HH	?Sleeve to Bypass
Adhesions		Dissect & Free adhesions
Eschar		Remove Eschar (Band)
Others ……		

Bleeding

Injury

Mechanism of Bleeding / Injury

- Access / Trocar injury
- Dissection / Thermal injury
- Instrument / Solid Organ

Aortic injuries during laparoscopic gastric bypass for morbid obesity in Sweden 2009–2010: a nationwide survey

Magnus Sundbom [1], Jakob Hedberg [2], Anders Wanhainen [3], Johan Ottosson [4]

Mechanism of Bleeding / Injury

- Access / Trocar injury
- Dissection / Thermal injury
- Instrument / Solid Organ

All 41 centers performing LRYGB in Sweden were asked if an aortic injury had occurred during the years 2009-2010. 11,744 LRYGBs were performed. The analysis revealed 5 aortic injuries,

risk for an aortic injury was 0.043% overall and 0.091% when an optical trocar was used.

Magnus Sundbom et al. SOARD 2014

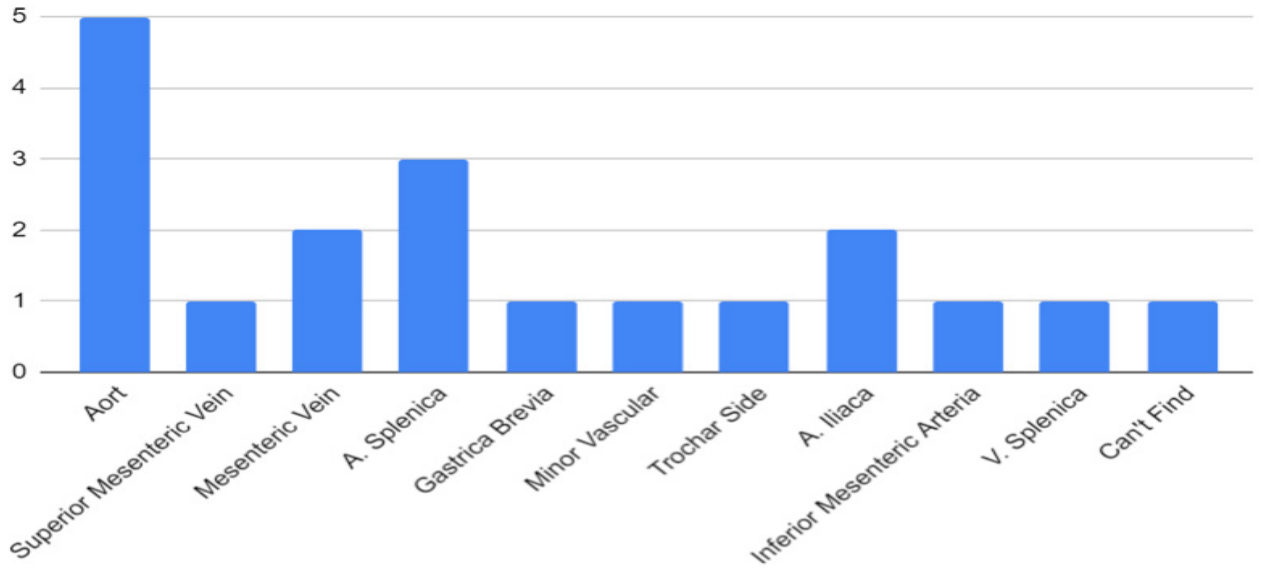
Unreported rare but serious complication: Major vascular injuries during bariatric surgery

Talar Vartanoğlu Aktokmakyan, M.D., Caghan Peksen, M.D., Osman Anıl Savaş, Aziz Sumer, M.D.

Mechanism of Bleeding / Injury

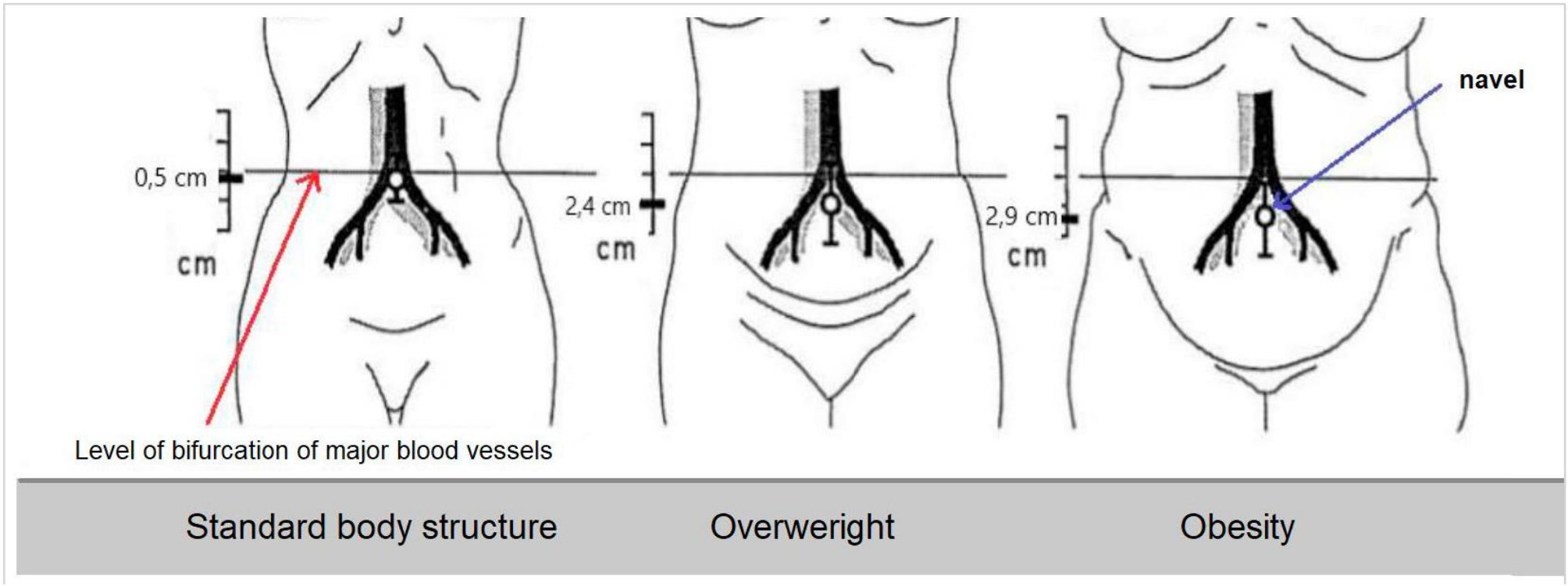
- Access / Trocar injury
- Dissection / Thermal injury
- Instrument / Solid Organ

nationwide survey in Turkey; 76 out of 365 bariatric surgeon response
16.9% (12 surgeons) report experience of major vascular injuries



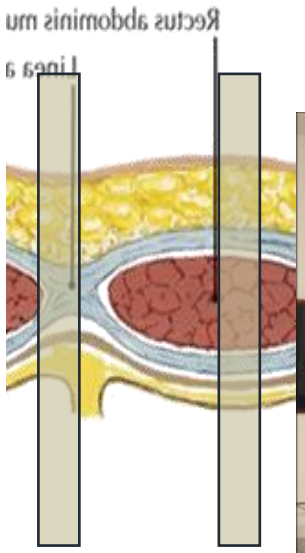
Aktokmakyan et al. Ulus Travma Acil Cerrahi Derg, 2023

Major Vascular injury – Avoid & Aware

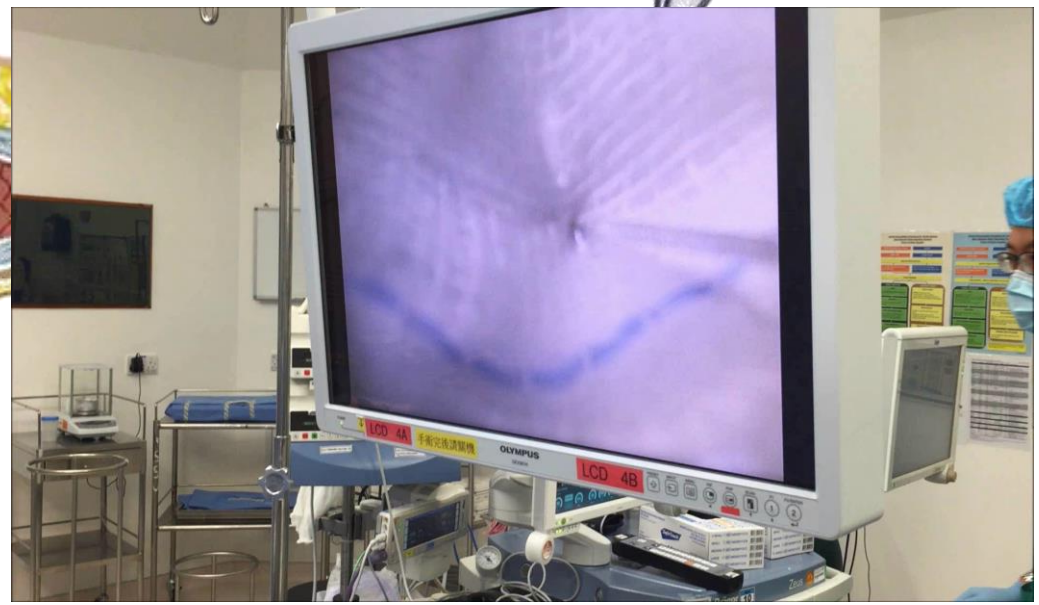


Paśnik et al. Pol Przegl Chir 2019

Major Vascular injury – Avoid & Aware



- 0 degree laparoscope
- Paramedian entry
- Oblique Pathway
- Point away major vessel



Major Vascular / Aorta injury – Management

The Effectiveness of a Systematic Algorithm for the Management of Vascular Injuries during the Laparoscopic Surgery

6 surgeons was assessed during 10 laparoscopic nephrectomies in a porcine

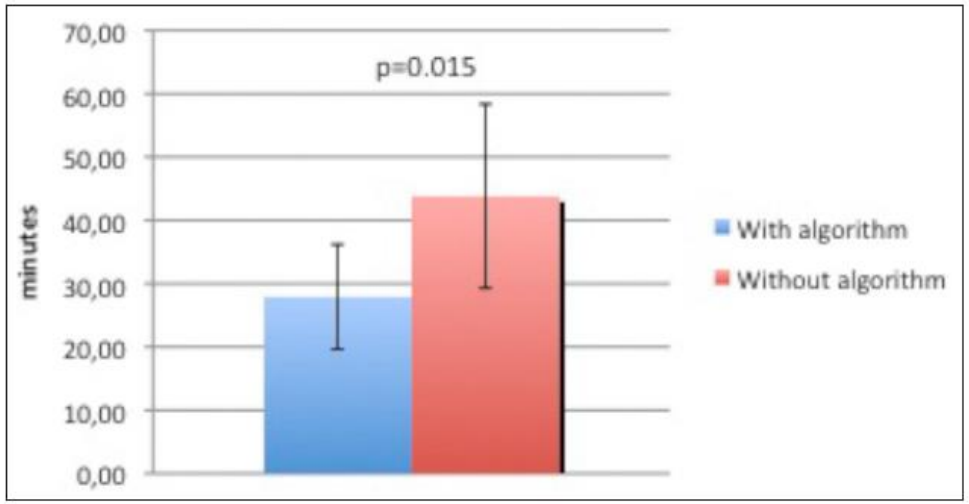


Fig. 2. Total operative time.

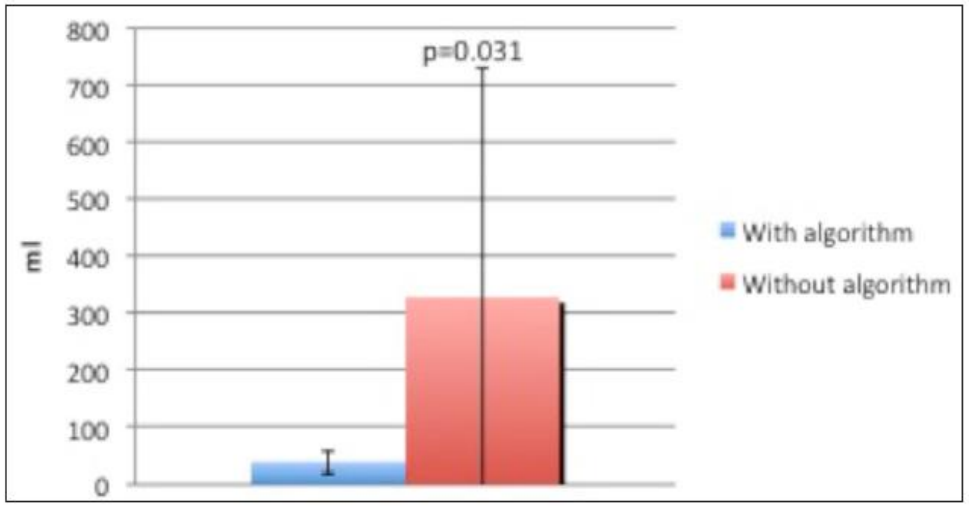


Fig. 3. Aspirated blood loss.

Passerotti et al. Current Urology 2015

Major Vascular / Aorta injury – Management

Convert Open Laparotomy

- Declare major vascular emergency
- Intraoperative consult
- Arrest the bleeding with direct pressure
- Communicate effectively with team
- Access – central / arterial lines
- Resuscitation – blood transfusion
- Massive transfusion protocol
- Risk management

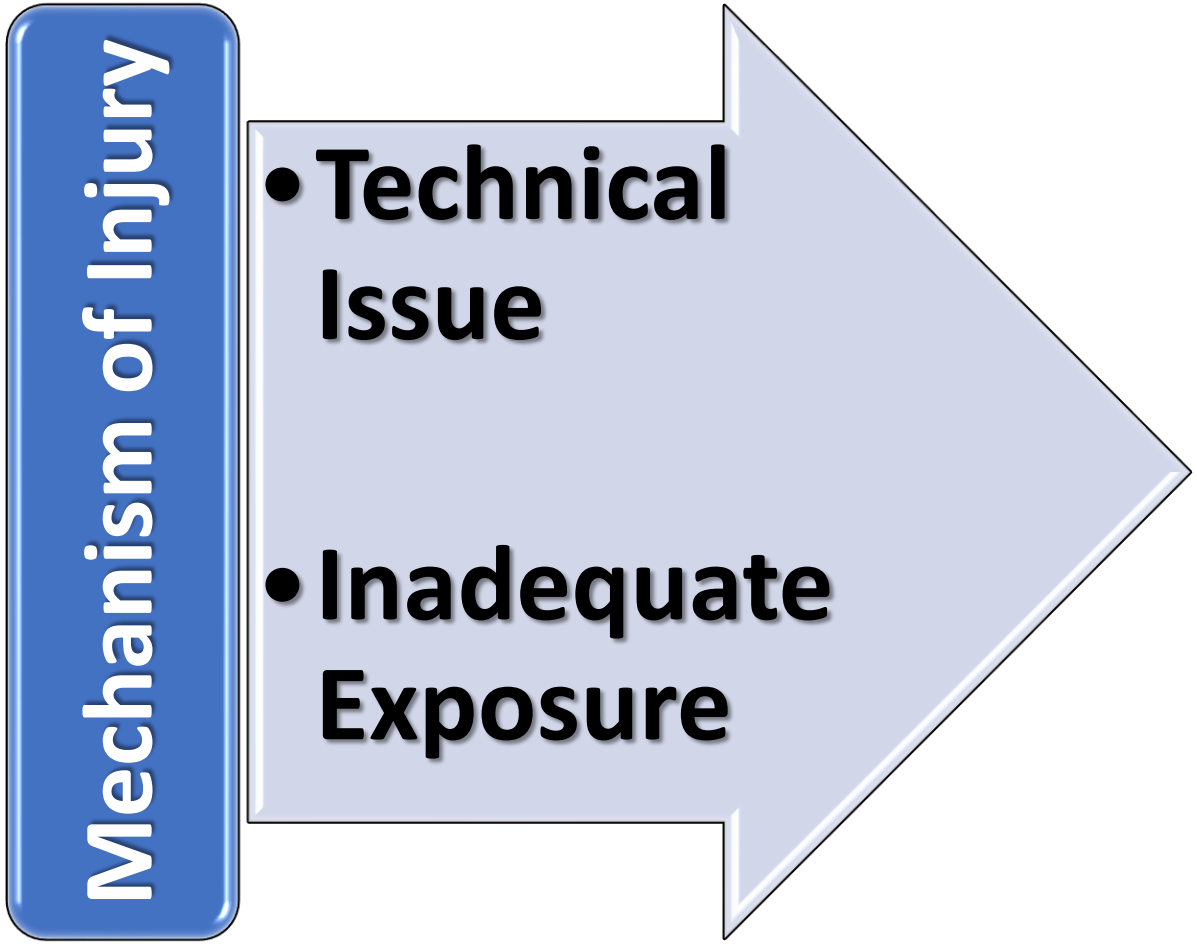
Other Vascular injury

Trocar related

- Inferior vena cava
- Iliac vein
- Mesenteric vessel

Splenic Artery Injury

Splenic Artery Injury – Mechanism

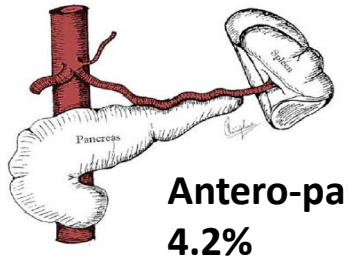


Splenic Artery Injury – Mechanism

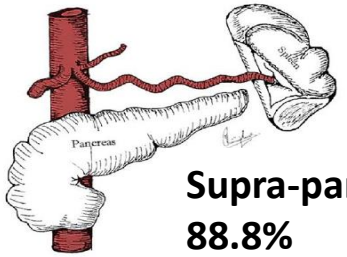
Mechanism of Injury

- **Technical Issue**
- **Inadequate Exposure**

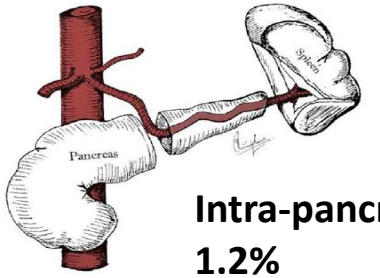
- **Surgeon skill / experience**
- **Hemostatic Device**
- **Anatomic variation**



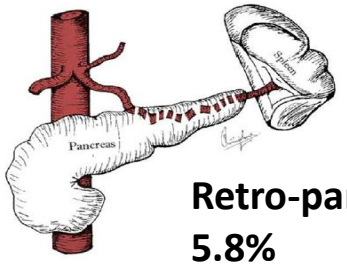
Antero-pancreatic
4.2%



Supra-pancreatic
88.8%



Intra-pancreatic
1.2%



Retro-pancreatic
5.8%

Manatakis DK et al. Surgical and Radiologic Anatomy (2021)

Splenic Artery Injury – Mechanism

Comparison of lateral thermal damage of the human peritoneum using monopolar diathermy, Harmonic scalpel and LigaSure

Nikica Družijanić, MD PhD,* Zenon Pogorelić, MD PhD,† Zdravko Perko, MD PhD,* Ivana Mrklić, MD,‡ and Snježana Tomić, MD PhD‡

- Surgeon skill / experience
- Hemostatic Device

Direct Pressure
Slow down Bleeding

- Gauze Packing
- Forceps clamping

Energy Device
- Diathermy
  - Monopolar/ bipolar
- Ultrasonic Shear
- Bipolar Sealer

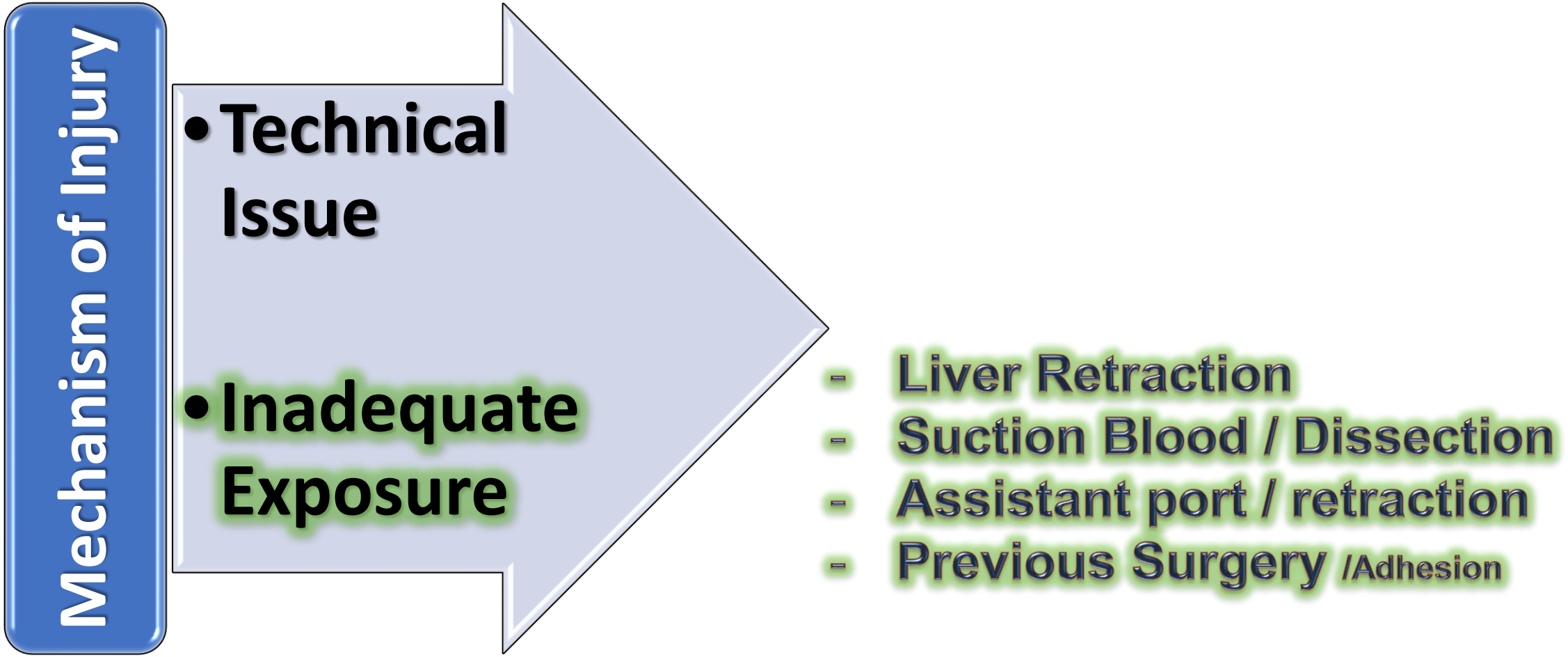
Medium Vessel
< 7mm
(Short gastric)

XX

Large Vessel
> 7mm
(Splenic artery)

Mechanical Device
- Metal Clips
- Plastic Clips
- Suture
- Vascular Staple

Splenic Artery Injury – Mechanism



Splenic Artery Injury – Mechanism

Mechanism of Injury

- **Technical Issue**
- **Inadequate Exposure**

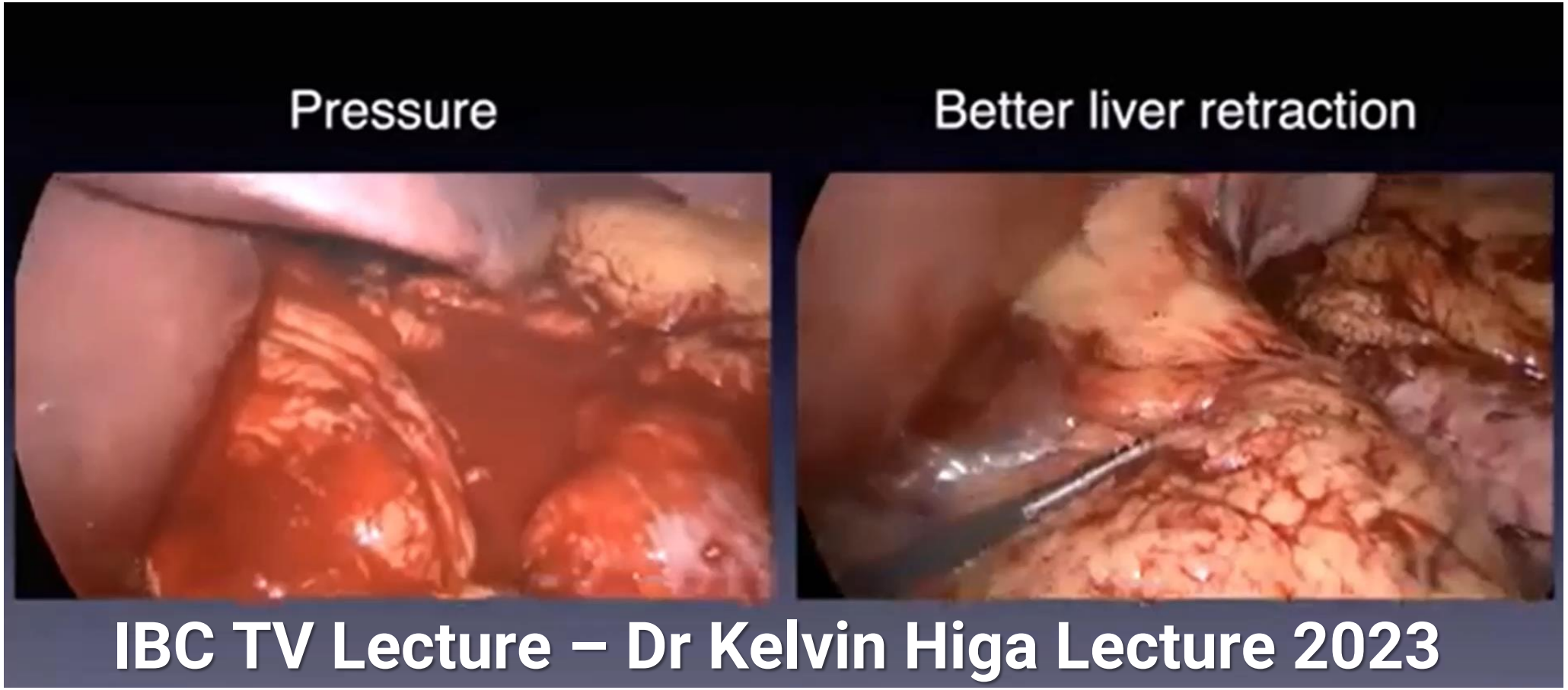
Don't Panic - Avoid Wrong Decision

- Suction – identify bleeder
- Gauze Packing
- Appropriate hemostatic method

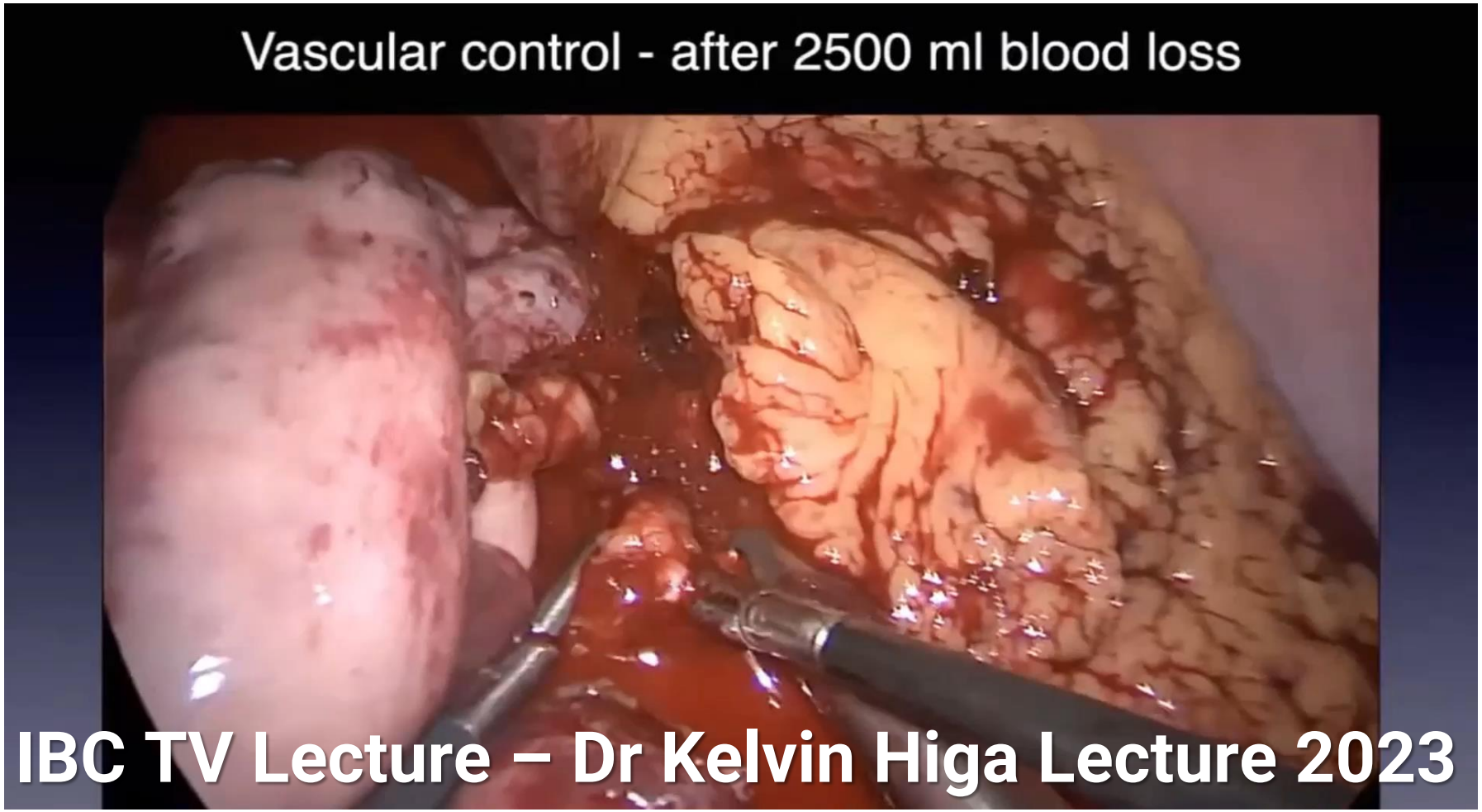
- Inform the team
- Understand your skill level
- Call for Help

- Team not prepared for this occurrence
- Bleeding Interfering with visualization

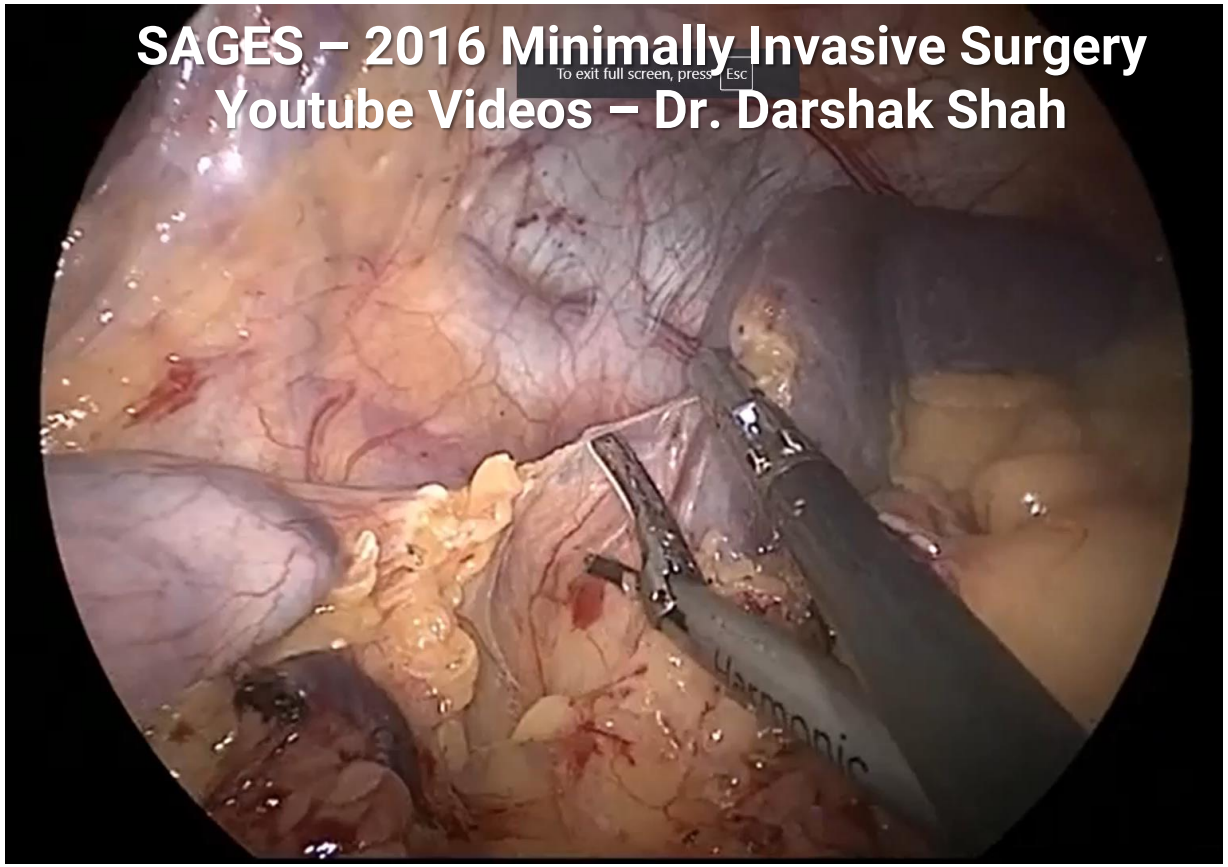
Splenic Artery Injury – Mechanism



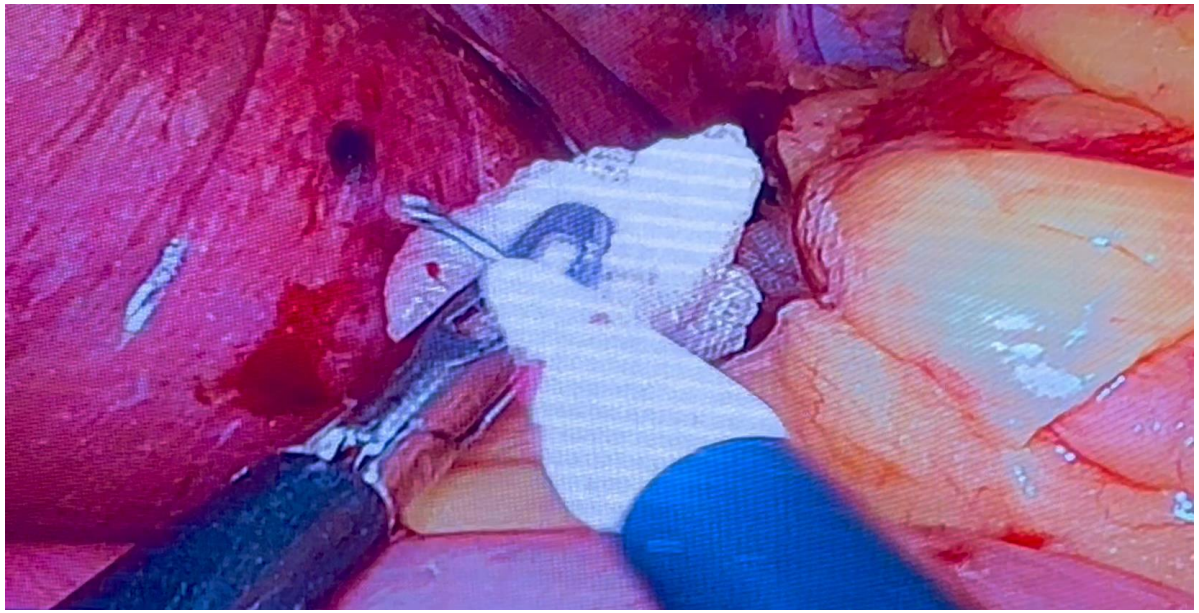
Splenic Artery Injury – Mechanism



Other injury – Stop Bleeding

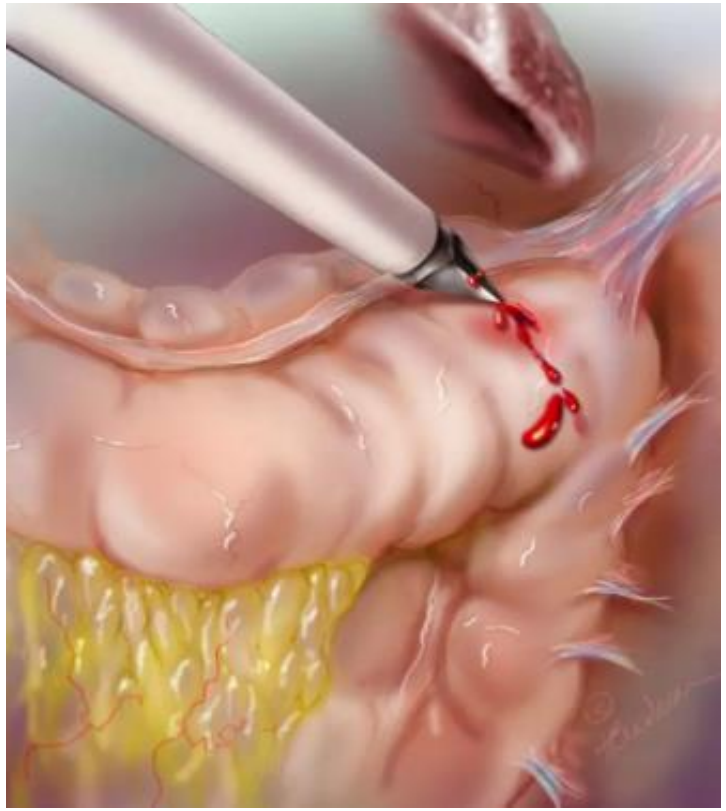


"Hot-Pot Cooking" Hemostasis Spleen / Liver



Other injury – Bowel

- **Incidence 0.1-0.7%**
- **Cause by Veress needle / Trocar / instrument**
- **Penetrating injury usually recognize intra-Op**
- **Thermal injury – delay perforation**

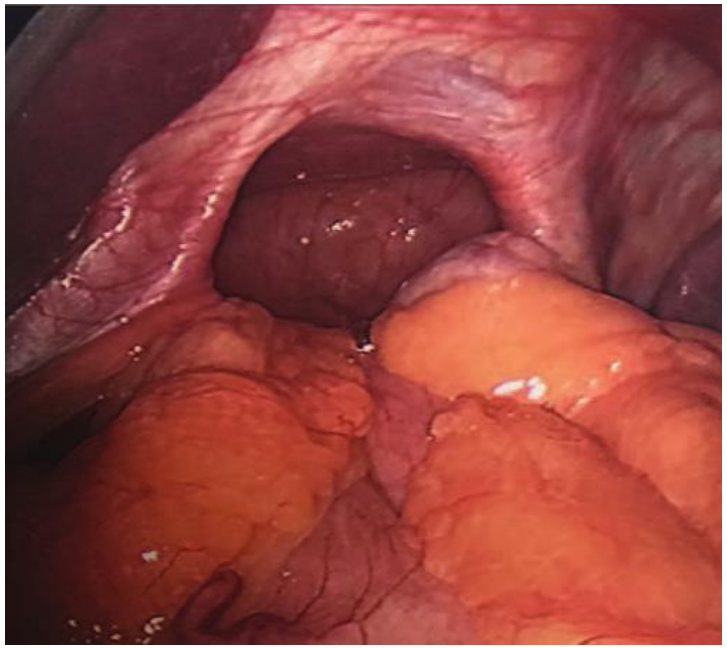


Sharp injury

- **Serosal**
  - **Inspect / no treatment**
- **Full thickness**
  - **< ½ cumerference → Suture repair (longitudinal)**
  - **> 1.2 circumference → Bowel resection**
- **Mesentery vessels**
  - **Hemostasis**
  - **Ischemia → resection**

Schrenk P et al. Gastroint Endosc 1996
Bishoff J et al. J Urol 1999

Large Hiatal Hernia



Gastroesophageal Reflux disease

Western GERD

- **GERD Symptom >20%**
- Esophagitis >10%
- Hiatus hernia >15%
- Barrett esophagus 1.5%-4.5%

Western Bariatric Patient

- Prevalence of Symptom >40%
- Hiatus hernia ~50%

Kang JY et al Alimen Pharm Ther 2006

Asian GERD

- **GERD Symptom <10%**
- Esophagitis <5%
- Hiatus hernia <10%
- Barrett esophagitis <1%

Asia Bariatric Patient

- Prevalence of Symptom <15%
- Hiatus hernia ~10%

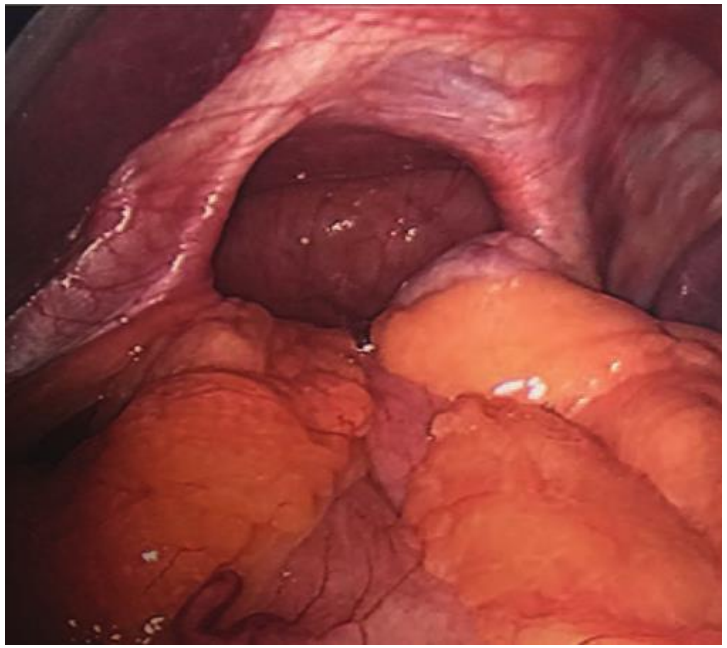
Suter M et al Obes Surg 2004

Tai CM et al Surg Endosc 2013

Diagnosis Pre-Op

- Endoscopy
- Barium
- HRM

Large Hiatal Hernia



Gastroesophageal Reflux disease

Diagnosis Intra-Op

- Laparoscopic Examination
  - Anterior
  - Posterior

Diagnosis Pre-Op

- Endoscopy
- Barium
- HRM

IFSO Position Statement on the Role of Esophago-Gastro-Duodenal Endoscopy Prior to and after Bariatric and Metabolic Surgery Procedures

Brown WA et al. Obesity Surgery (2020)

- **OGD should be considered for all patients with upper GI symptoms.**
- **OGD should be considered for patients without upper GI symptoms as 25.3% chance of an unexpected finding that may alter management or contra-indicate surgery.**
- **OGD should be routinely considered in populations where the community incidence of upper GI pathology is high, particularly when stomach being inaccessible**
- **OGD should be undertaken routinely for all patients after bariatric surgery at 1 year and then every 2–3 years for patients who have undergone LSG or OAGB**

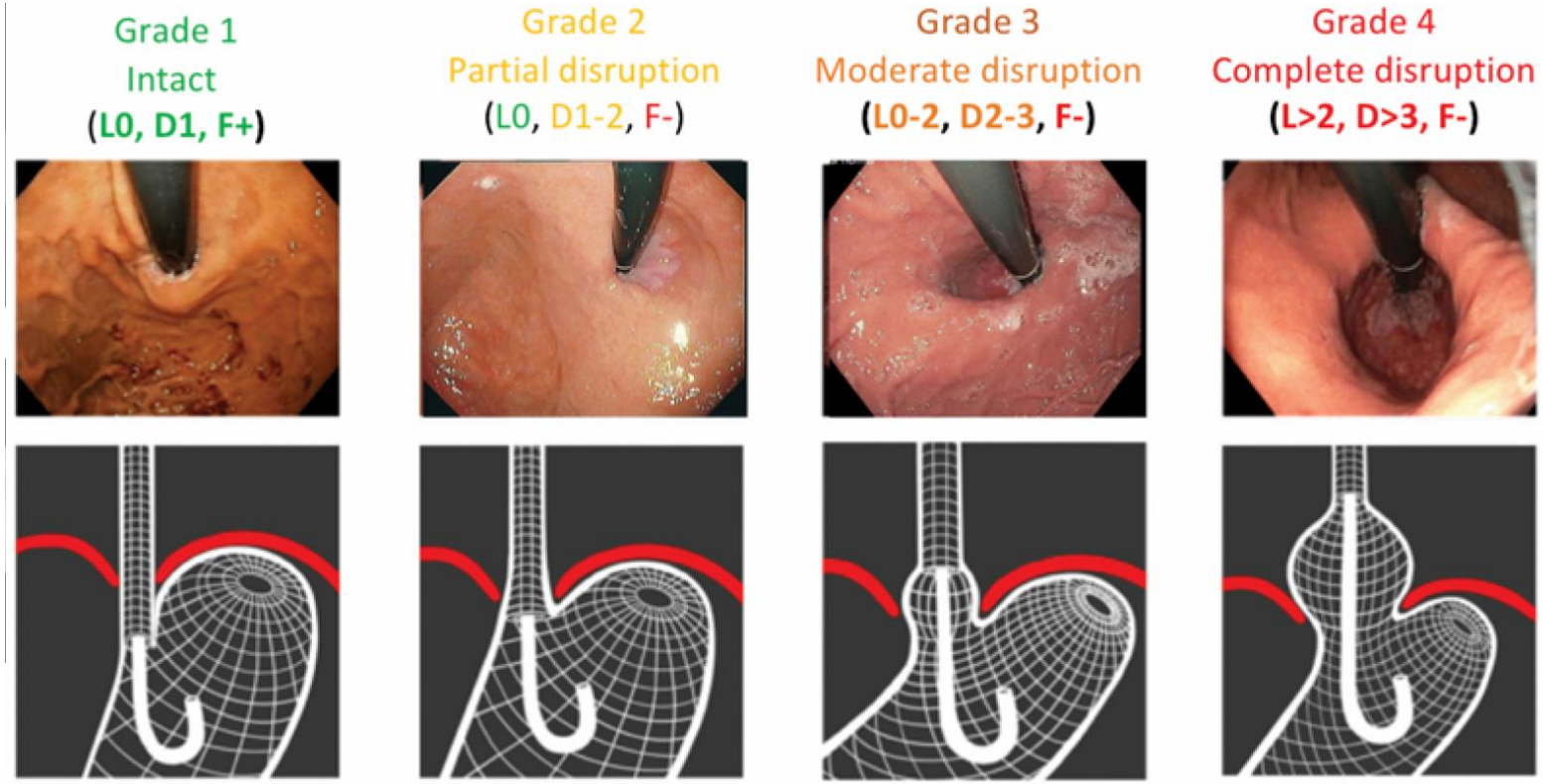
Diagnosis Pre-Op

- Endoscopy
- Barium
- HRM

IFSO Position Statement on the Role of Esophago-Gastro-Duodenal Endoscopy Prior to and after Bariatric and Metabolic Surgery Procedures

Brown WA et al. Obesity Surgery (2020)

Hill Classification of Gastroesophageal Flap Valve



Gastro-esophageal diagnostic workup before bariatric surgery or endoscopic treatment for obesity: position statement of the International Society of Diseases of the Esophagus

ISDE The International Society for Diseases of the Esophagus

Statement	Consensus score	Recommendation and quality of evidence
1. Preoperative EGDS should be considered in all patients planning to undergo bariatric surgery	90.9%	Conditional recommendation—low-quality evidence
2. Preoperative identification and subsequent repair of hiatal hernia larger than 2 cm may improve outcomes in patients undergoing bariatric procedures	100%	Conditional recommendation—low-quality evidence
3a) A contrast esophagogram should not be used for the diagnosis of GERD before bariatric procedures 3b) A contrast esophagogram may be performed to identify the presence of hiatal hernia in case of clinical suspicion	90.9%	Strong recommendation—moderate quality of evidence

Visaggi P et al. Disease of the Esophagus 2024

Routine Use of Esophago-gastro-duodenoscopy (EGD) in Bariatric Surgery – An International Survey of Our Current Practice

METHODS

International survey based on IFSO recommendations

Do surgeons offer EGD before and after bariatric surgery?

Do surgeons offer surveillance EGD after laparoscopic sleeve gastrectomy (LSG) and one-anastomosis gastric bypass (OAGB)?

RESULTS

n=121

72% were aware of IFSO recommendations

% Surgeons routinely offering EGD

53.7% **Pre-op**

14.3% **Post-op**

24.2% **Every 2-3 years after LSG**

20.3% **Every 2-3 years after OAGB**

CONCLUSION

Majority of bariatric surgeons worldwide offer routine pre-operative EGD, with less compliance for post-operative EGD recommendations.

Sharmaine Y L Quake (1), Ghazaleh Mohammadi-Zaniani (1), Aya Musbahi (1), Oliver Old (2), Michael Courtney (1), Peter Small (1)

(1) Department of Upper GI and Bariatric Surgery, South Tyneside & Sunderland NHS Foundation Trust, UK.

(2) Department of Upper GI and Bariatric Surgery, Gloucestershire Hospitals NHS Foundation Trust, UK.

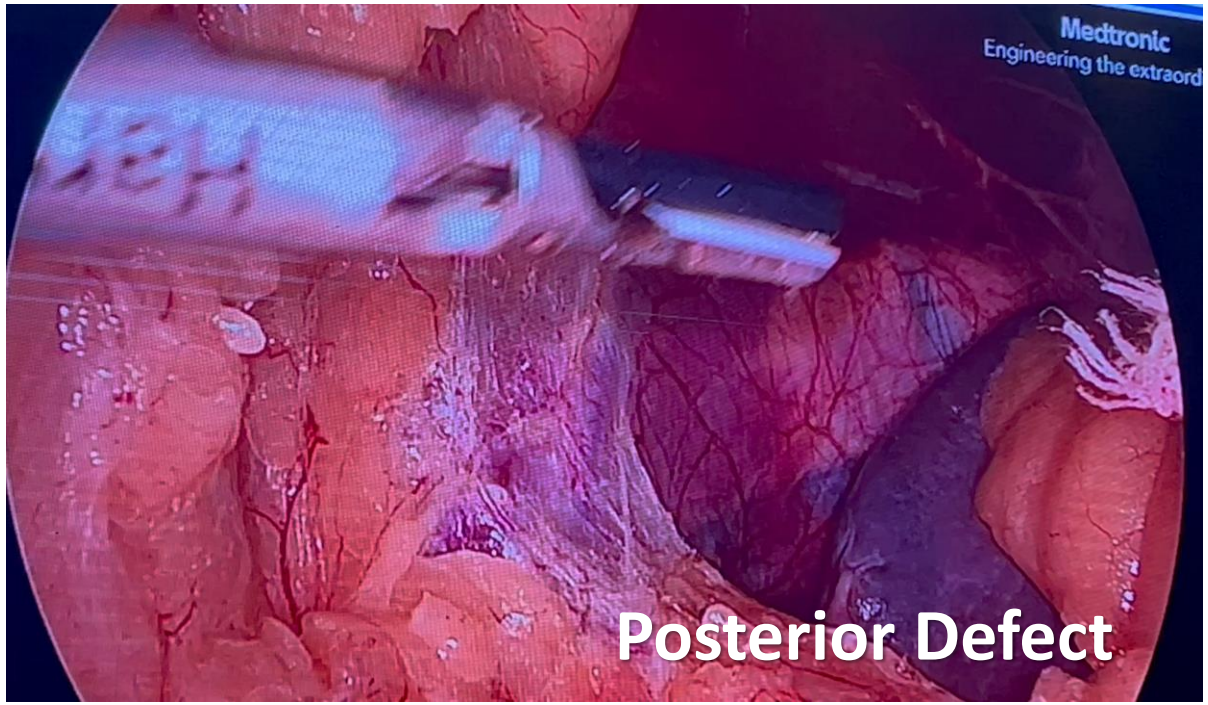
OBESITY SURGERY

The Journal of Metabolic Surgery and Allied Care

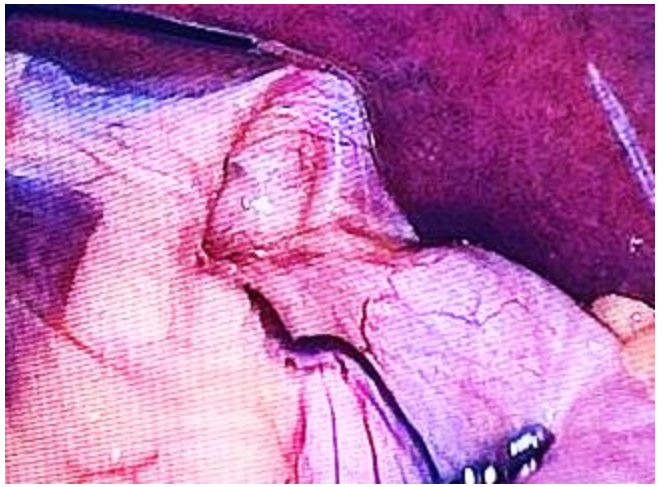
Original article

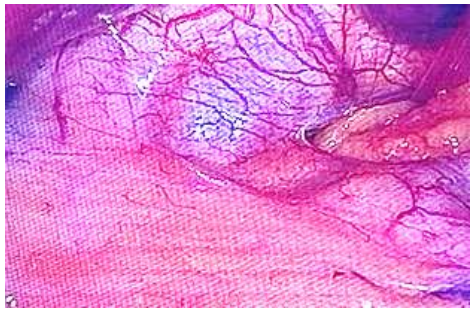
Fifth International Consensus Conference: current status of sleeve gastrectomy

84% of bariatric surgeons look for HH and think it should be repaired if found.



Anterior Defect



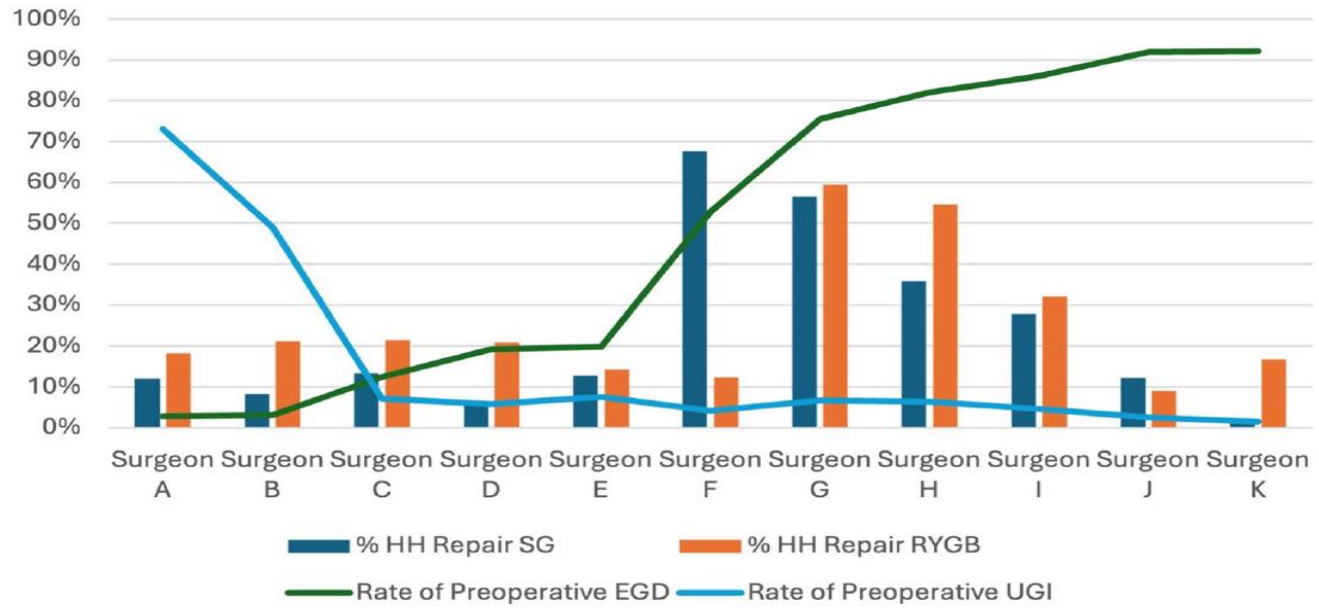


Surgeon variability in repair of hiatal hernia at the time of bariatric surgery

MBSAQIP
METABOLIC AND BARIATRIC SURGERY ACCREDITATION AND QUALITY IMPROVEMENT PROGRAM

3,487 bariatric surgeries were performed across 4 hospitals and 11 surgeons (2481 SG and 1006 RYGB). HH were concurrently repaired during 24% of operations.

		Outcome of Surgery	
		Hiatal hernia repaired	No hiatal hernia repair
EGD Findings	Hiatal hernia	195 (14%)	118 (8%)
	No hiatal hernia	282 (20%)	832 (58%)
UGI Findings	Hiatal hernia	24 (3%)	14 (2%)
	No hiatal hernia	95 (12%)	630 (82%)



Valukas CS et al. Surg Endosc 2024

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Conclusion

Recognizing and Management of Unexpected Problems

- Intraoperative Accident is rare but may associate with high morbidity and mortality
- Always be prepare for the **Worse** but Do your **Best** to avoid it – Learn from mistake
- Understand the mechanism of injury and choice the right strategy to tackle the problem
- Do not panic – get your OT team ready – Call for help immediately if necessary