

**BSGIE Annual Meeting 2016**

**GASTRO-INTESTINAL EMERGENCIES IN ENDOSCOPY**  
**SHOULD I STAY OR SHOULD I GO ?**  
for Endoscopists and Endoscopy Nurses  
THURSDAY 22 SEPTEMBER 2016 - KINEPOLIS IMAGIBRAINE


How to deal with delayed perforation

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**How to deal with delayed perforation?**


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**Definition**

- Delayed perforation is an intestinal perforation
  - that is detected **after the scope has been withdrawn**
  - following completion of ESD/EMR during which perforation did not occur
  - most cases of delayed perforation occur within **14 h after the operation**
- Mechanism:
  - Subtle injury to the muscularis propria
- Symptoms and signs:
  - abdominal pain, fever, and inflammatory response
- Diagnosis:
  - Abdominal CT
  - Plain X-ray
  - Elevated CRP and WBC

Tanaka, Dig Endoscopy 2015; Burgess, Gut 2016



**CT findings**



Shir, Clin Radiol



**Frequency**


- Perforation rates associated to colonoscopy
- Perforation rates associated to polypectomy

**Table 1. Complication rates per colonoscopy indication**

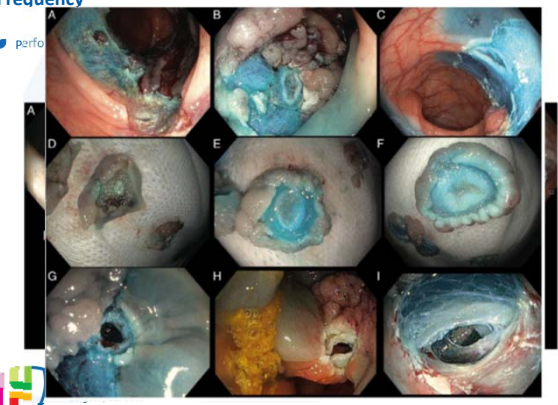

	Overall				Indication for colonoscopy				P value			
	All		With polypectomy*		Without polypectomy*		Screening/ surveillance	Symptoms				
	95% CI	N <sup>†</sup>	95% CI	N <sup>†</sup>	95% CI	N <sup>†</sup>	95% CI	N <sup>†</sup>				
Perforation (per 1,000 colonoscopies)	0.5 (0.4-0.7)	16	0.8 (0.6-1.0)	13	0.4 (0.2-0.8)	12	0.3 (0.2-0.5)	12	1.3 (0.6-2.3)	6	<0.001	
Bleeding (per 1,000 colonoscopies)	2.6 (1.7-3.7)	16	9.8 (7.7-12.1)	14	0.6 (0.2-1.1)	11	<0.001	2.4 (0.9-4.6)	9	4.6 (0.1-15.8)	5	<0.001
Mortality (per 100,000 colonoscopies)	2.9 (1.1-5.5)	18	NA	NA	NA	NA	NA	NA	NA	NA		

CI, confidence interval; NA, not applicable; \*irrespective of indication; <sup>†</sup>Number of studies included in analysis (data available).

Reumkens, Am J Gastroenterol 2016



**Frequency**

### Factors predicting deep muscular injury during EMR and supposedly delayed perforation

Univariable factors	No major DMI	Major DMI	Totals	p Value
Dysplasia (%)				
No or LGD	632 (97.8%)	14 (2.2%)	646	0.009
HGD or submucosal invasive cancer	146 (93.6%)	10 (6.4%)	156	
Submucosal invasive cancer (%)				
No	730 (97.5%)	19 (2.5%)	749	0.017
Yes	48 (90.6%)	5 (9.4%)	53	
Best fitting multiple logistic regression model	Adjusted OR	p Value		
Location group				
Distal colon (cecum to splenic flexure)	2.03 (0.76 to 5.40)	0.160		
Transverse	3.35 (1.15 to 11.0)	0.028		
Proximal colon (hepatic flexure to caecum)	1			
Dysplasia				
None or LGD	1			
HGD or submucosal invasive cancer	2.97 (1.25 to 7.06)	0.014		
Resection technique				
Proximal excision	1			
En bloc excision	3.84 (1.51 to 9.77)	0.005		

OR indicates p values <0.05.  
Data missing unless noted do not add up to 100.  
Included in multivariable analysis.  
DMI, deep mural injury; HGD, high grade dysplasia; ICV, ileo-caecal valve; LGD, low grade dysplasia.

Burgess, Gut 2016

### What about the Japanese?

Variables	All (N = 345,546), n	Perforation (n = 161, 0.05%), n (%)	P value*	Adjusted odds ratio (95% CI)	P value
<b>Tumor-related factors</b>					
Therapeutic colonoscopy					
ESD	16,812	35 (0.02)	<.001	Reference	
Polypectomy	108,886	60 (0.06)		0.15 (0.09-0.26)	<.001
EMR	219,848	66 (0.03)		0.14 (0.09-0.22)	<.001
Tumor size					
<2 cm	309,606	126 (0.04)		Reference	
≥2 cm	35,940	35 (0.10)		2.68 (1.61-4.44)	<.001

Nikura, Gastrointest Endosc 2016

### Management: there is no EBM!

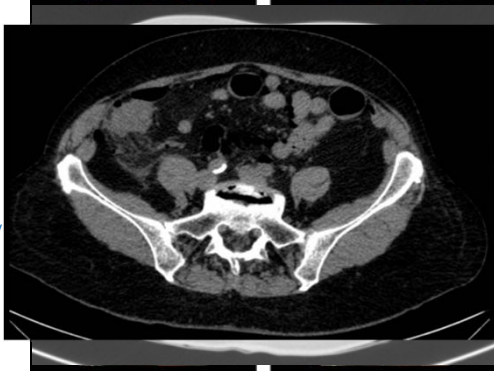
Table 4 Differences between survivors and non-survivors of surgery after colonoscopic perforation.

	Survivor (n = 26)	Non-survivor (n = 3)	P
Mean age (years)	73.9	69	0.48
Sex			
Female	20	1	0.18
Male	6	2	
Delay to surgery (days)	0.9	1.8	0.29
Peritonitis			
No	21	1	0.14
Yes	5	2	
Cause of perforation			
Mechanical	12	2	0.3
Barotrauma	11	0	
Polypectomy/coagulation	3	1	
ASA classification			
II	9	0	0.009
III	16	2	
IV	0	1	

Tanaka, Dig Endoscopy 2015; Shin, Clin Radiol 2015; van der Sluis, Colorectal Disease 2011

### Case #1

- Woman 79y old
- ASA2
- ESD right colon
- 12h post-op
- Pain
- Fever



- CT
- Augmentin IV
- Home at day 5

### Case #2

- Man 79y old
- ASA 2
- ESD right colon
- Same night
- Pain
- CT
- Home at day 11 post-endoscopy



### Summary (no conclusions possible)

- Be aware
- Know the risk factors
- Inspect your resection site
- Consider conservative management