

Small Bowel Endoscopy

Dr Jonathan Hoare
Consultant Gastroenterologist and Endoscopy Lead

St Mary's Hospital
Imperial College, London

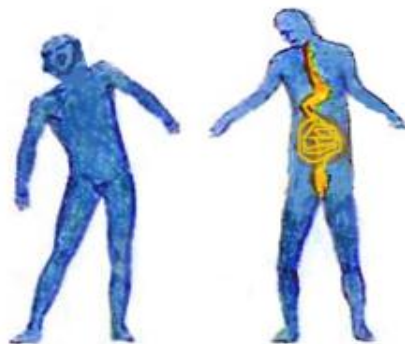
(Equipment support from Olympus)

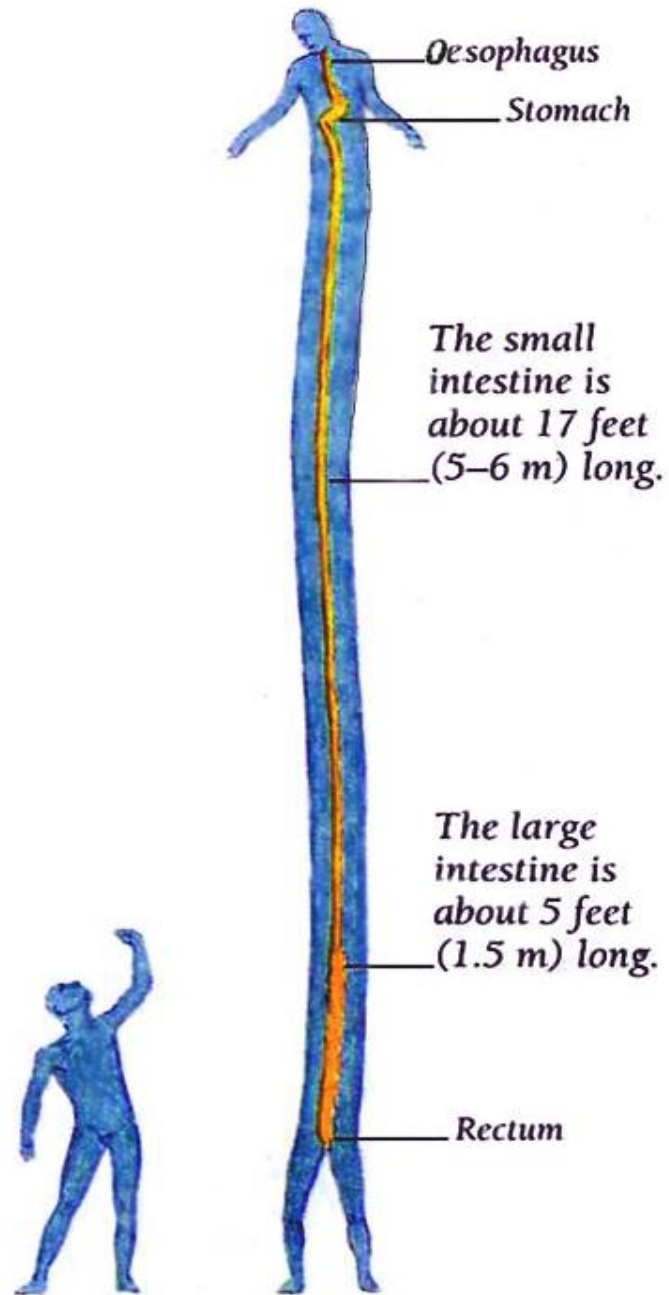
Learning goals!

- To understand technology available for scoping the small bowel
- Indications and limitations of capsule endoscopy
- Indications and limitations of device assisted enteroscopy

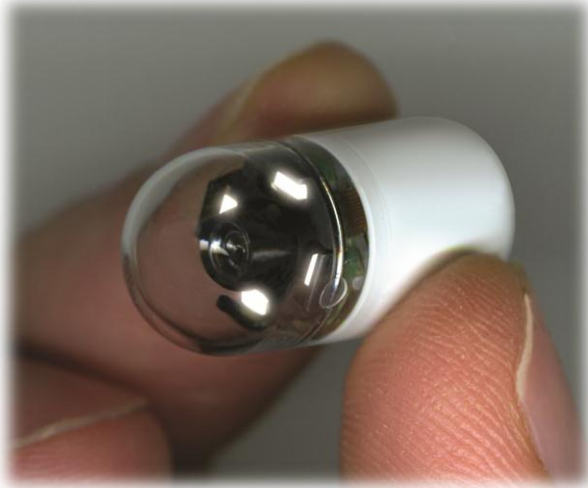
Summary

- The problem with the small bowel
- Old technology
- Capsule Endoscopy
- Device assisted enteroscopy
- Cases
- The future





Capsule endoscopy



- “Pill” containing camera, light and transmitter
- Transmits 55,000 (2-4/sec) over 10-12 hours
- Images collected by abdominal leads/stored
- Downloaded and video read on computer
- Capsule is disposable!

Indications for Capsule Endoscopy

- **Obscure bleeding**
 - Iron deficiency anaemia
 - Crohn's disease
 - Refractory coeliac disease
 - Small bowel polyposis
 - Abnormal imaging of small bowel
 - Neoplastic surveillance (melanoma, lymphoma)
- **Bowel transplant**

Advantages

- Convenient
- Comfortable
- Non-invasive
- No sedation
- No analgesia
- No prep?
- **Pan-enteric**

Number of Investigations before Capsule Endoscopy



	<i>Bleeding disorders studies</i>	<i>Nonbleeding disorders studies</i>	<i>Total</i>
Number of patients	310	220	530
Previous investigations, n			
Gastroscopy	771	338	1 109
Colonoscopy	633	399	1 032
Small-bowel series	239	312	551
Push enteroscopy	391	52	443
Computed tomography (CT)	98	107	205
Abdominal radiography	27	49	76
Nuclear medicine	61	21	82
Angiography	72	10	82
Intraoperative enteroscopy	4	5	9
Total	2 296	1 293	3 589
Mean number of procedures per patient	7.41	5.88	6.77

Lewis et al. Endoscopy 2005

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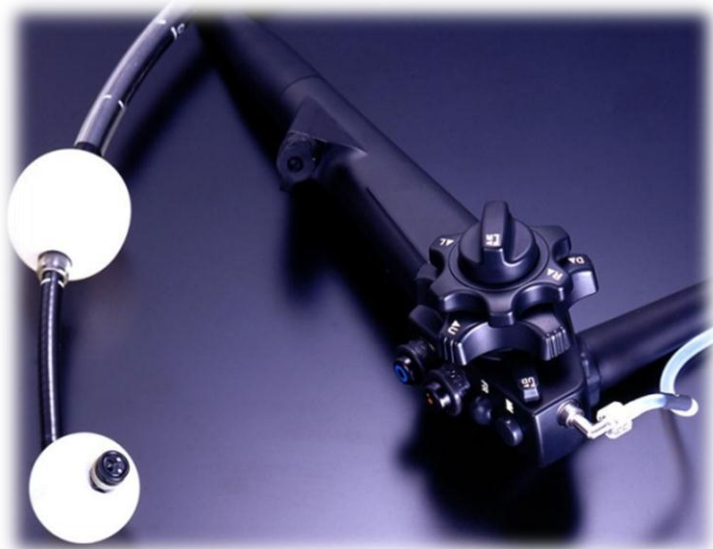


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How good is capsule

- Yield is 60%
 - *Indications and detection, completion, and retention rates of small-bowel capsule endoscopy: a systematic review.*
 - *Liao Z et al. GIE 2012*
 - 22,840 procedures / 66% for OGIB
 - **Yield all cases – 59.4%**

Device Assisted Enteroscopy



2001



2007



2008

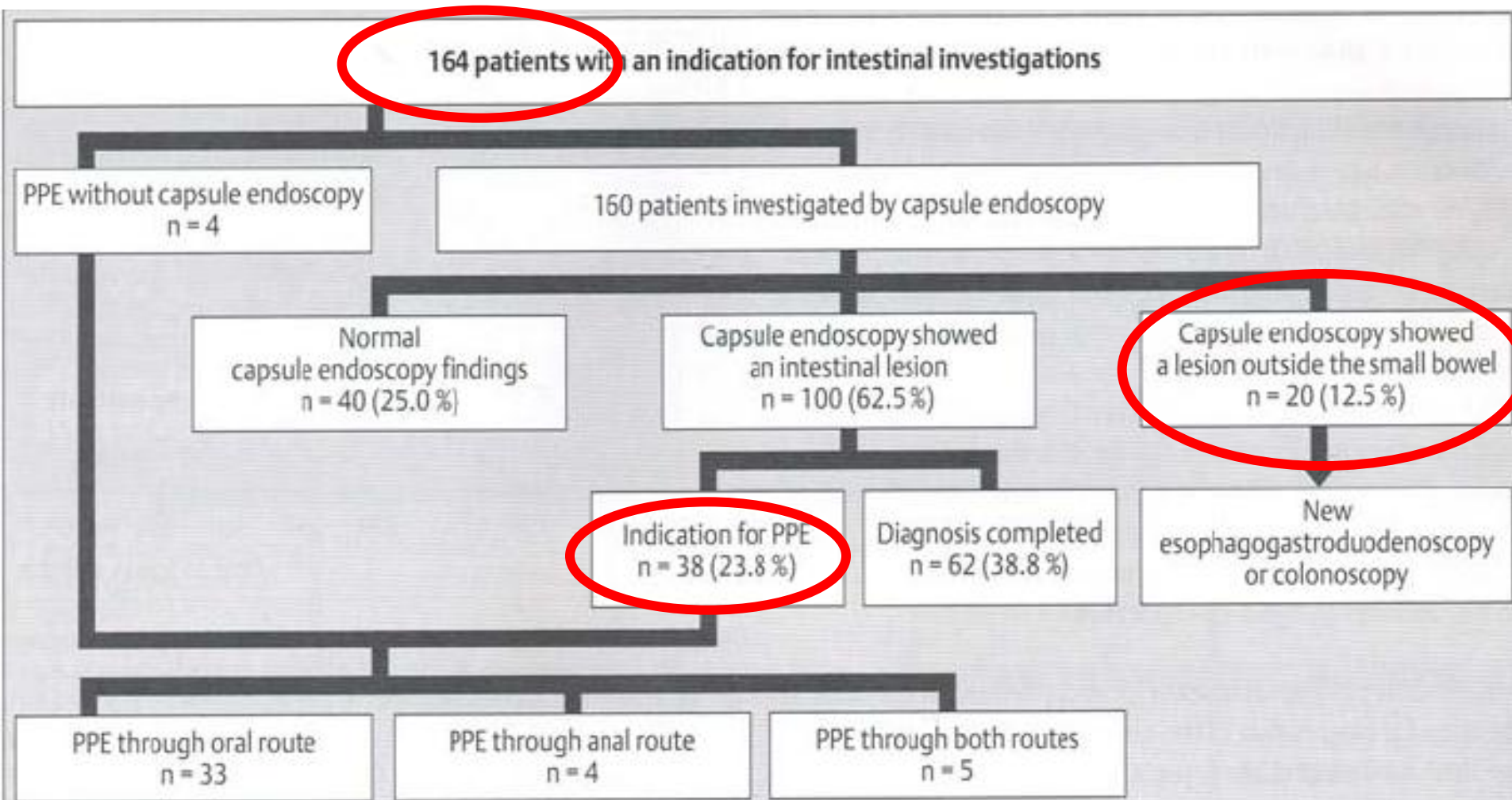
Indications

- As per capsule endoscopy / Instead of capsule??
- Haemostasis (APC, clipping)
- Tissue diagnosis post capsule/CT/MRI/coeliac
- Lesion removal (polypectomy, EMR)
- Localise lesion (tattoo)
- Stricture dilatation and stenting
- Percutaneous jejunostomy
- Difficult colonoscopy
- Altered anatomy
 - Roux-en-Y ERCP/exploration
 - Post bariatric surgery
- Foreign body retrieval (capsule)

Advantages

- Much deeper intubation than previous techniques
 - up to 4 metres in one examination
- Complete small bowel examination achievable
 - Bi-directional – approx. 45% success
- Targeted therapy
 - APC/dilatation/polypectomy
- Reduce need for surgery
- Useful for small bowel lesions requiring further investigation – biopsy/tattoo
- Less complications
- Faster recovery

Balloon Enteroscopy/Indications



Insertion Route: Guided by SBCE

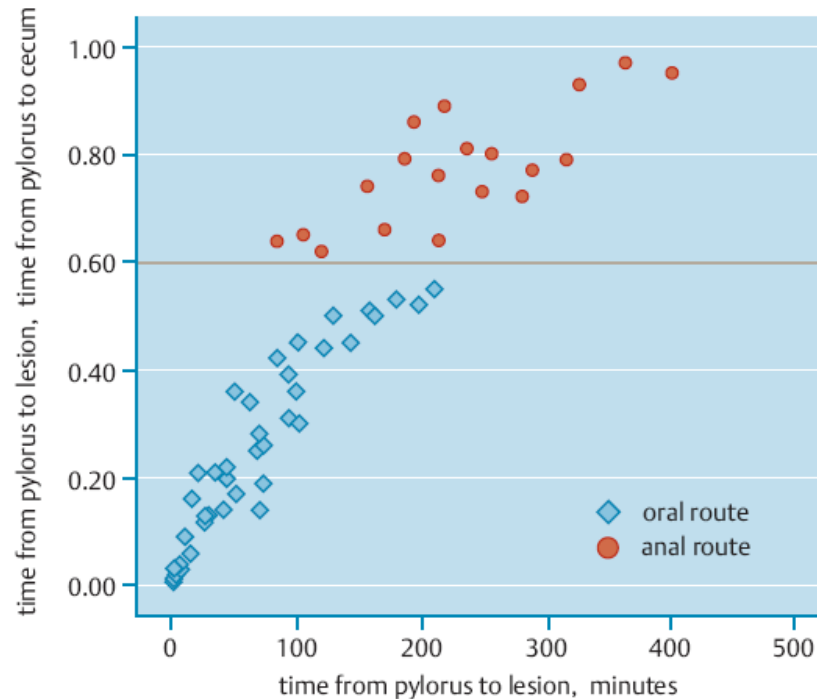


Fig. 1 Role of capsule endoscopy in determining the insertion route for the first double-balloon enteroscopy (DBE) procedure. The x-axis represents the transit time of the capsule from the pylorus to the lesion. The y-axis represents the transit time of the capsule from the pylorus to the lesion divided by the time between pylorus and the arrival of the capsule in the cecum.

Predictive role of capsule endoscopy on the insertion route of double-balloon enteroscopy.

Li X et al. Endoscopy. 2009

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**723 patients;
1400 exams;
Diagnostic
yield: 65%
Therapeutic
yield: 64%**

Yield of DBE in Patients With Obscure GI Bleeding

Author, year (reference)	Patients with bleeding ^a /DBE examinations (%)	Diagnostic yield (%)	Diagnostic or treatment success (%)
Yamamoto et al, 2004 ¹⁴²	66/178 (37)	76	61
May et al, 2005 ¹⁴⁰	90/248 (36)	80	76
Ell et al, 2005 ¹⁴⁴	64/147 (44)	72	62
Di Caro et al, 2005 ¹⁴⁵	33/89 (37)	80	42
Matsumoto et al, 2005 ¹⁵¹	13/22 (59)	46	N/A
Mehdizadeh et al, 2006 ¹⁴¹	130/237 (55)	43	60
Hadithi et al, 2006 ¹⁴⁶	35/35 (100)	60	77
Heine et al, 2006 ¹⁴⁷	168/275 (61)	73	55
Kaffes et al, 2006 ¹⁴⁸	32/40 (80)	48	75
Monkemuller et al, 2006 ¹⁴⁹	29/70 (41)	67	57
Nakanura et al, 2006 ¹⁵⁰	32/28 (100)	41	43
Manabe et al, 2006 ¹⁵²	31/31 (100)	74	74
Totals	723 patients, 1400 examinations	65	64

Long-term outcome after argon plasma coagulation of small-bowel lesions using double-balloon enteroscopy in patients with mid-gastrointestinal bleeding

Endoscopy 2011; 43: 759 – 765

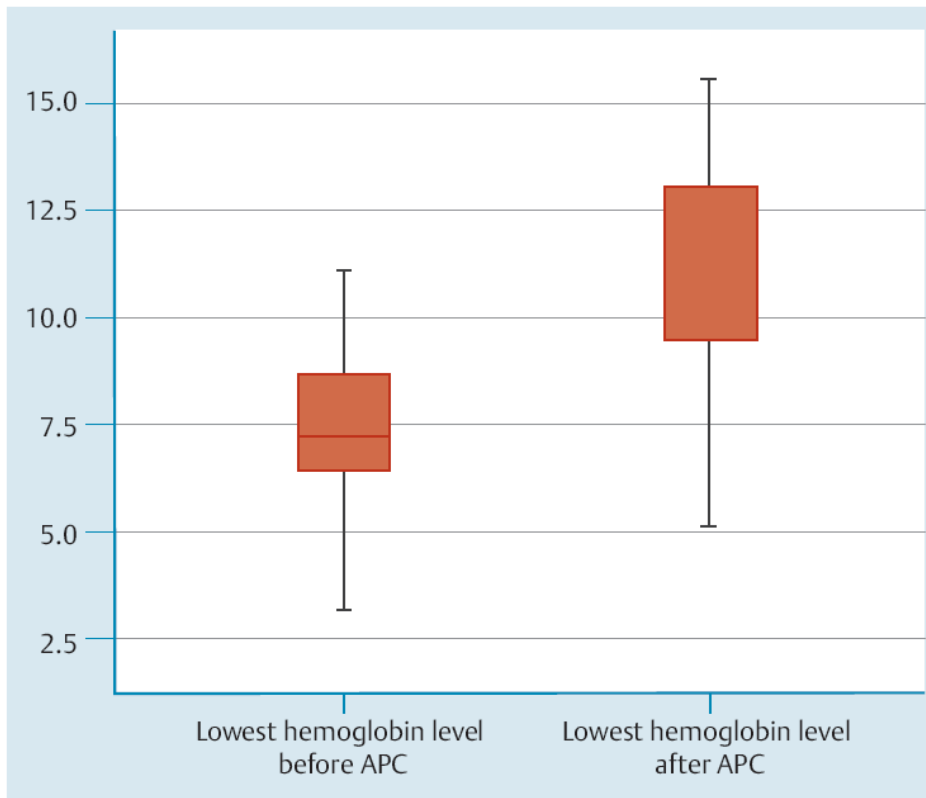


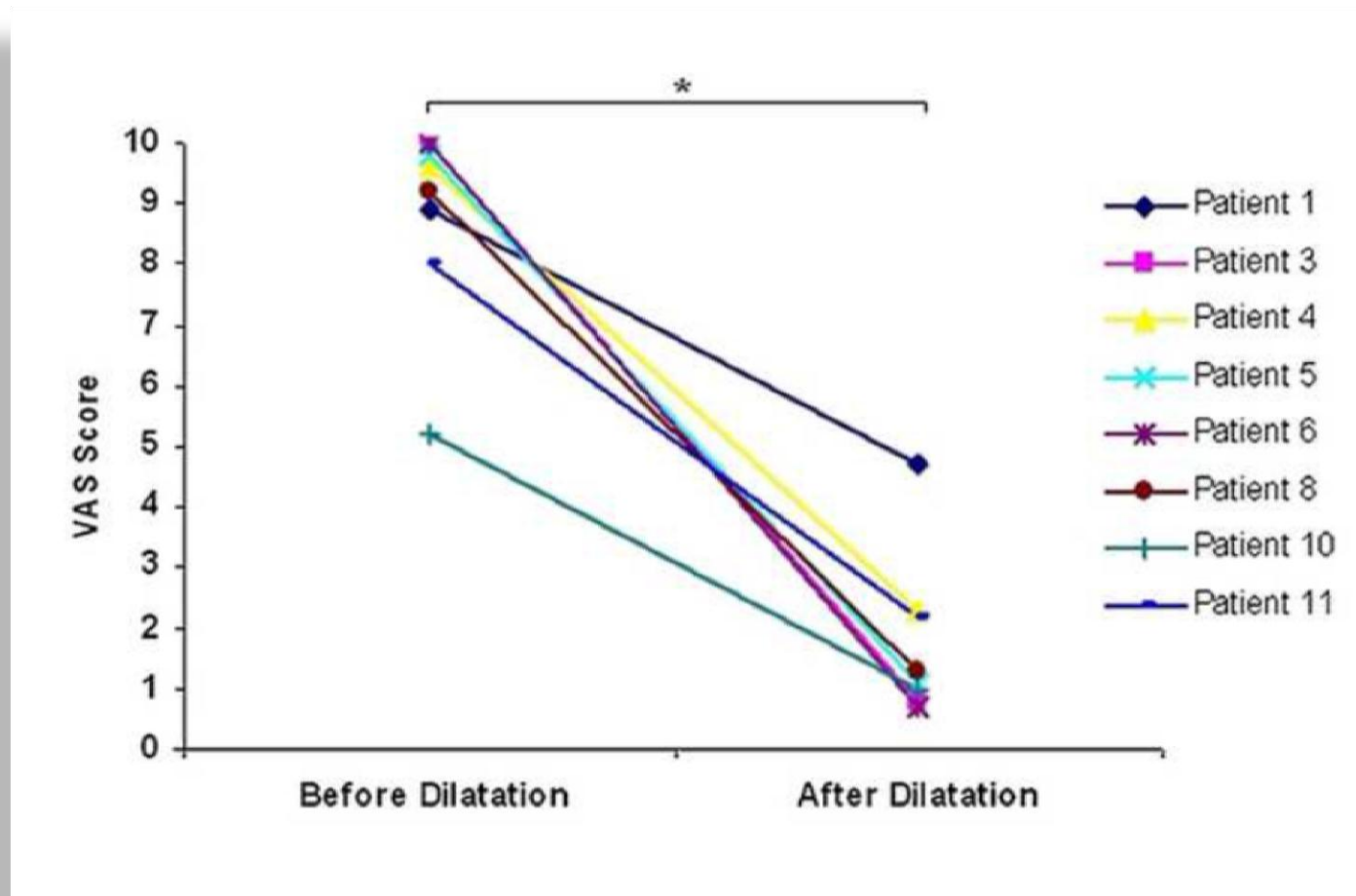
Fig. 1 Hemoglobin levels before and after argon plasma coagulation.

Mean follow up 54 months (44-72)

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VAS symptom scores pre & post-dilatation by DBE



Gastrointest Endosc. 2009 Despott EJ et al..

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Balloon Enteroscopy/Impact

- All indications
 - A retrospective study of the application on double-balloon enteroscopy in 378 patients with suspected small-bowel diseases. Zhong et. al, Endoscopy 2007
 - Retrospective series / largest published
 - Lesions detected in 247/378 (65.3%)
 - 84% had specific treatment
 - 91% symptoms improved or disappeared
- Failed colonoscopy
 - Gay et. al, Endoscopy 2007 : Complete colonoscopy in 28/29

Balloon Enteroscopy/Complications

- **Complications**

- **Complications of double balloon enteroscopy: a multicenter survey.** Endsink et. al, Endoscopy 2007
- 10 centres/4 continents
- 40 complications in 2362 procedures
 - 13 in 1728 diagnostic - 0.8%
 - 27 in 634 therapeutic - 4.3 %
- 7 cases pancreatitis – 0.3%
- perforation rate high for polypectomy (1.5%)

Balloon Enteroscopy: Limitations

- Long and difficult procedures
 - Resource intensive – time/equipment
 - Rectal approach
 - Pan enteroscopy in only 45%
 - Therapy is difficult
- Capsule/imaging first – know target
- Technology will evolve

Which scope?

- Trials between:
 - DBE vs. SBE – SBE “not inferior”
 - Spiral vs. DBE – Spiral quicker, DBE further
 - Spiral vs. SBE – Spiral further, SBE yield greater
- Not much difference!
 - DBE ? goes further
 - DBE ? better for retrograde
 - Spiral is quickest but probably need GA
 - SBE probably most “efficient”

- TECHNIQUE MORE IMPORTANT THAN DEVICE

Questions

Summary

- Small bowel endoscopy is here to stay!
 - Clear advantages over previous techniques
- Evolving field – technology and indications
- Capsule and balloon enteroscopy combine well for majority of cases
- Good evidence for diagnostic/therapeutics
- Safe – but higher complication rate than colonoscopy

Summary

- It is difficult and patients often complicated
- Great fun!

Thank you for your attention

Thanks to Dr Edward Despott, St Mark's for slides