Hand-assisted laparoscopic colorectal surgery

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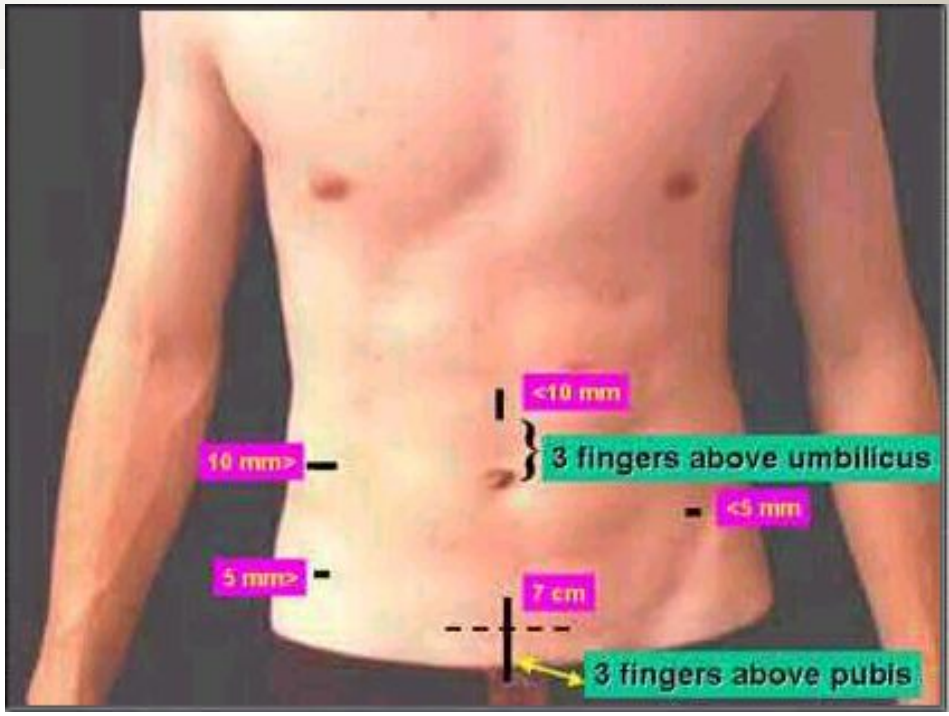
Basic principles

Hand as operating port, triangulation towards operative field

Non-dominant hand, neutral position

Distant/forward access

Potential conversion incision



Applications of HALS

When tactile feedback is essential

Intact organ removal is required

Utility incision required

Pure laparoscopic approach fails to progress before open conversion

Extremely complex operations where introduction of the hand will significantly increase speed and safety

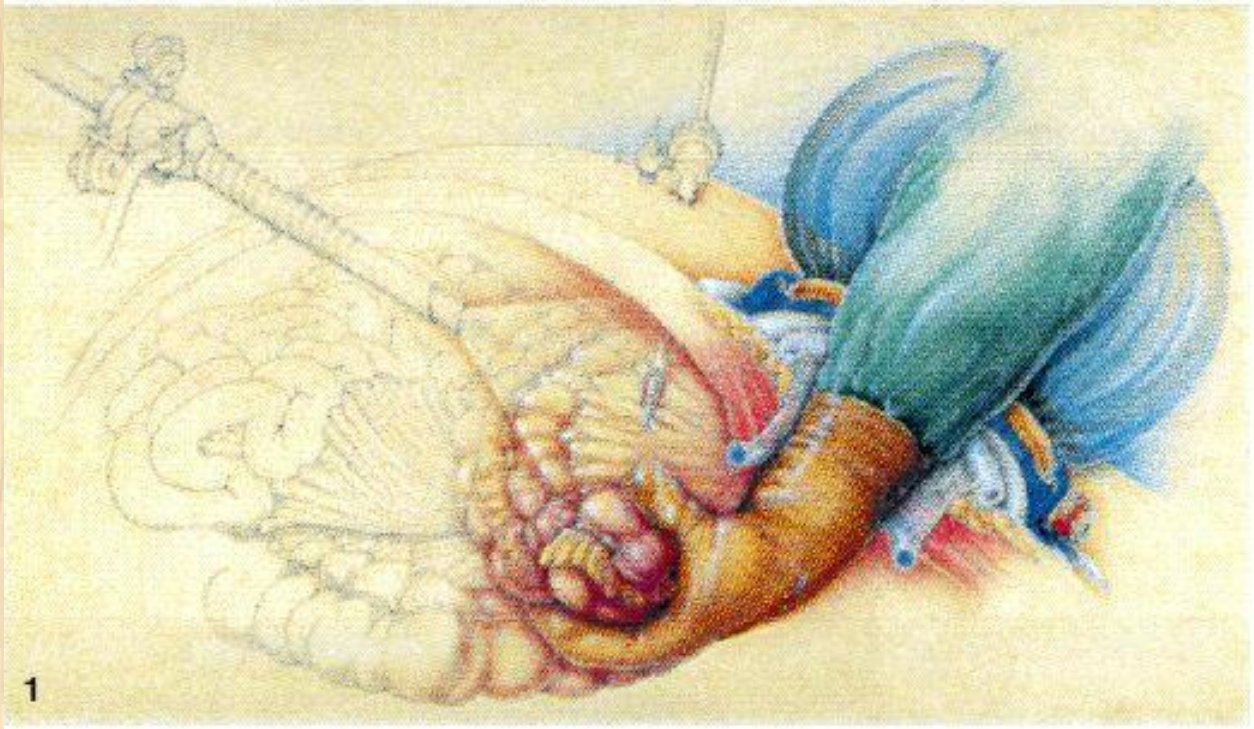


Fig. 1. Dexterity pneumosleeve and protractor retractor (Dexterity, Roswell, GA, USA).

Fig. 2. Intromit hand-access port (Medtech, Dublin, Ireland).

Fig. 3. Handport (Smith & Nephew, London, UK England).

Fig. 4. Lapdisc (Hakko-Medical, Tokyo, Japan).

Fig. 5. Omniport (Advanced Surgical Concepts, Dublin, Ireland).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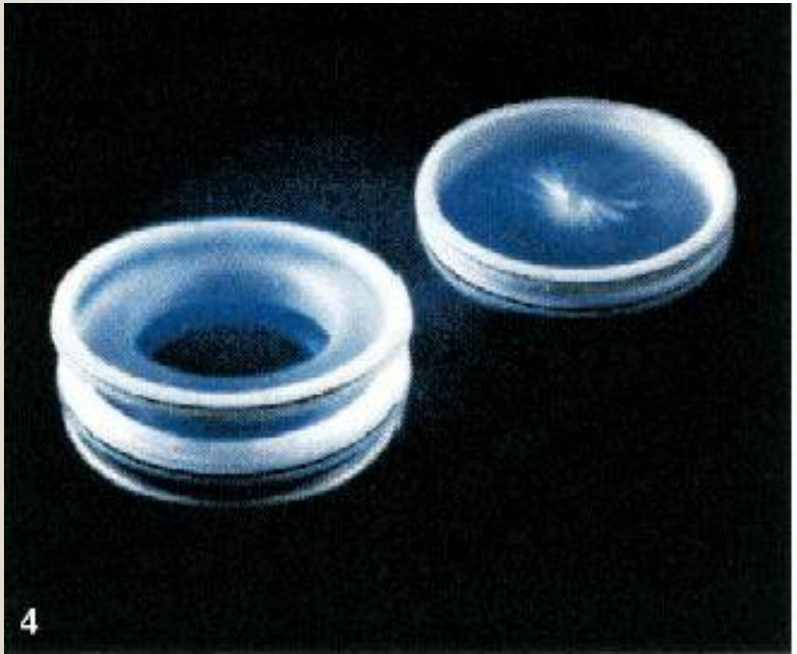
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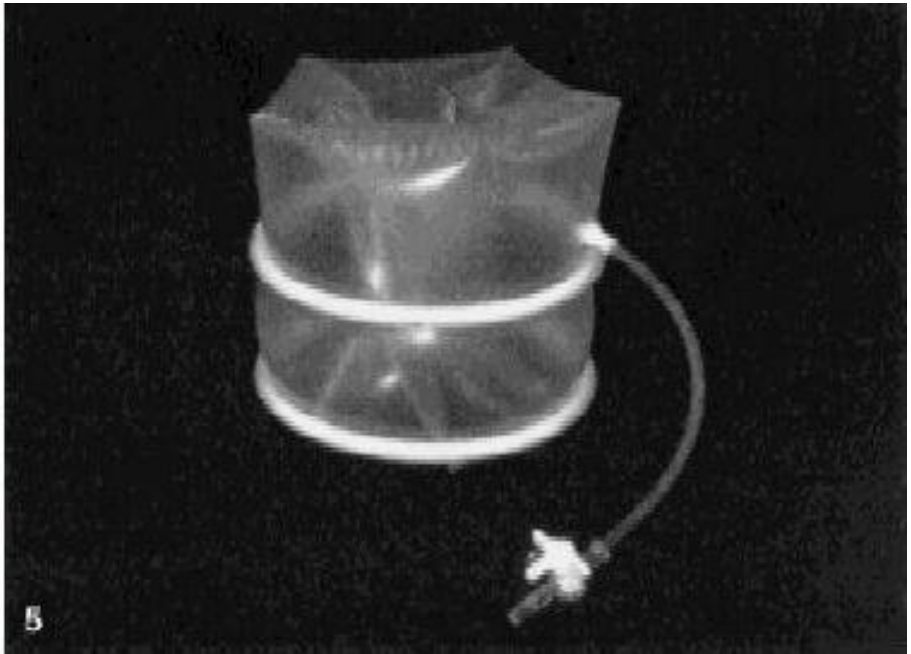
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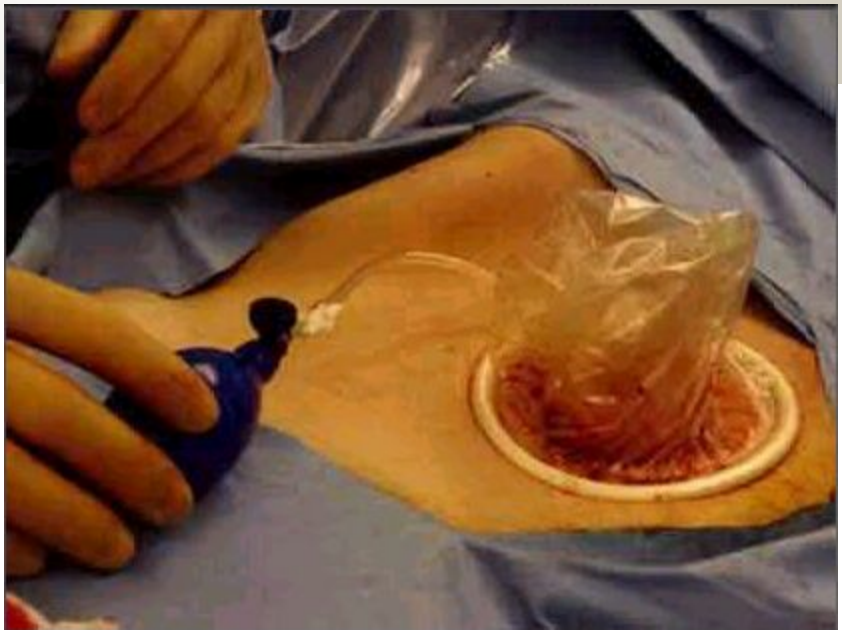

	Attachment	Abdominal wall space	Wound Components	Wound Retraction	Wound Protection	
Dexterity	Adhesive	Y	Multi	Y	Y	
Intromit	Adhesive	Y	Single	N	+/-	
Handport	Kissing balloon	Y	Multi	Y	Y	
LapDisc	Iris valve	N	Single	Y	Y	
Omniport	Pneumohelix	N	Single	Y		Y
GelPort	Gel-filled sleeve	Y	Multi	Y	Y	

Video Demonstration

A 10-min video presentation will demonstrate the following important steps in the safe conduct of a hand-assisted laparoscopic total abdominal colectomy for a benign colonic pathology of pancolonic diverticular disease with recurrent bleeding:

Patient selection and preparation
Positioning and port-sites
Insertion of hand-assist device
Ligation of vascular pedicles
Flexures mobilisation
Omental takedown
Specimen retrieval
Anastomosis


Hand-assisted laparoscopic total colectomy for pancolonic diverticular disease
D Koh, S Nalachandran, R Sim
Centre for Advanced Laparoscopic Surgery
Tan Tock Seng Hospital, Singapore

HALS Study Group

Diagnoses and Procedures

Diagnosis	Handport n=22	Laparoscopic n=18
Diverticular Disease	10	8
Adenoma/polyp	4	4
Inflammatory Bowel	4	1
Rectal prolapse	2	2
Incurable malignancy	0	2
Sigmoid volvulus	1	0
Colonic inertia	1	1

Surg. Endosc 2000; 14:896-901

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Diagnoses and Procedures

Procedure	Handport n=22	Laparoscopic n=18
Sigmoid resection	9	7
Right hemicolectomy	5	5
Subtotal colectomy	3	1
Resection rectopexy	2	2
Low anterior resection	1	1
Hartmann reversal	1	1
Ileocolectomy	1	0
Abdominoperineal resection	0	1

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Operative Parameters

Variable	Handport n=22	Laparoscopic n=18
Operative time		
ITT	152 (60-307)	141 (55-250)
Per protocol	144 (60-270)	152 (65-250)
Incision length	7.4 (5-9)	7.0 (4-20)
Anastomosis	21	18
Intracorporeal	8 (38%)	8 (44%)
Extracorporeal	13 (62%)	10 (56%)
EBL	147 (0-500)	126 (0-500)
Conversion	3	4
Trocars	2.4	3.3

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Difficulty Maintaining Pneumoperitoneum

(HandPort Group)

Procedure	Reason for Problem
Right hemicolectomy	Obesity (inadequate base ring seal)
Sigmoid colectomy	Obesity (base retractor came out)
Low anterior resection	Obesity (base retractor came out) [required conversion]
Subtotal colectomy	Abdominal wall contour - four previous operations (poor seal)
Sigmoid colectomy	Leakage of air from base retractor
Right hemicolectomy	Leakage of air from base retractor
Right hemicolectomy	Bulb attachment seal
Sigmoid colectomy	HandPort incision too close to pubis (poor seal)
Sigmoid colectomy	Unclear

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Postoperative Pain

Variable	Handport n=22	Laparoscopic n=18
POD #1:		
none-mild	12 (57%)	10 (55%)
moderate-severe	9 (43%)	8 (45%)
POD #3:		
none-mild	16 (73%)	14 (78%)
moderate-severe	6 (27%)	4 (22%)
POD #14:		
oral analgesics	7 (32%)	8 (45%)
no pain med.	15 (68%)	10 (55%)

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Postoperative Outcome Measures

Variable	Handport n=22	Laparoscopic n=18
Return of bowel Function		
POD #1	3 (14%)	2 (11%)
POD #3	17 (77%)	14 (78%)
Liquid diet		
POD #1	8 (36%)	8 (44%)
POD #3	20 (91%)	18 (100%)

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Postoperative Outcome Measures

Variable	Handport n=22	Laparoscopic n=18
Length of Hospitalization (days)		
ITT	7.0 (2-12)	6.0 (2-10)
Per protocol	7.2 (2-12)	5.0 (2-10)
Complications		
Wound infection(sup.)	0	2
Wound infection(deep)	0	1
Intraabdominal abscess	1	0
Hematochezia	0	1

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Functional Recovery

Quality of Life (SF-36)	Handport n=22	Laparoscopic n=18
Physical Functioning:		
preoperative score	80	78
30-day follow-up	75	75
General Health:		
preoperative score	62	64
30-day follow-up	74	71

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Hand-Assisted Laparoscopic Colectomy

Taragona, E. et.al. University of Barcelona

- 54 patients in RCT comparing HALS and LAS colectomy for left (31) or right (23) colon lesions (CA, volvulus, polyps)
- HALS – 7-7.5 cm LLQ or RUQ transverse hand access incision
- LAS extraction incision in same area as hand access.

Surg. Endosc 2002; 16:234-239

Hand-Assisted Laparoscopic Colectomy

Taragona, E. et.al. University of Barcelona (cont.)

	HALS	LAS
Conversion	2%	22% (4/6 to HALS)
Complications	26%	22% (1 leak each)
Hospital Stay	6 days	6 days
⊕ Peritoneal Cytology	0	0
Benefit of HALS	9	4
Operating Time	120 min.	135 min.

Hand-Assisted Laparoscopic Colectomy

Taragona, E. et.al. University of Barcelona (cont.)

Inflammatory Response

- IL6:
  - increased in HALS > LAS POD 1-5
- C Reactive Protein:
  - increased in HALS > LAS POD 1-3

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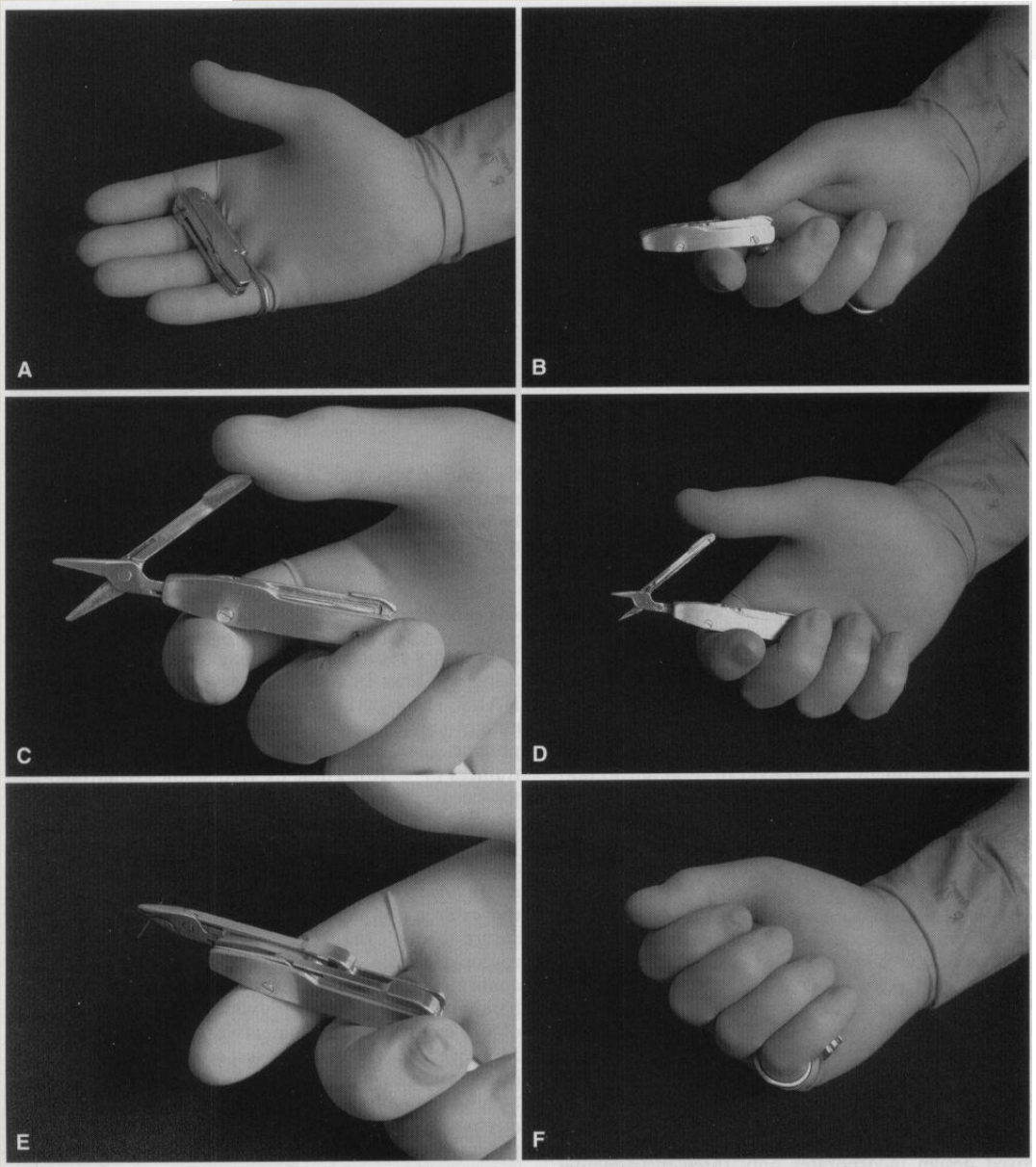

Fig. 2. A–F Deployment of two instruments (scissors and needle driver) from the Dundee Multitool.

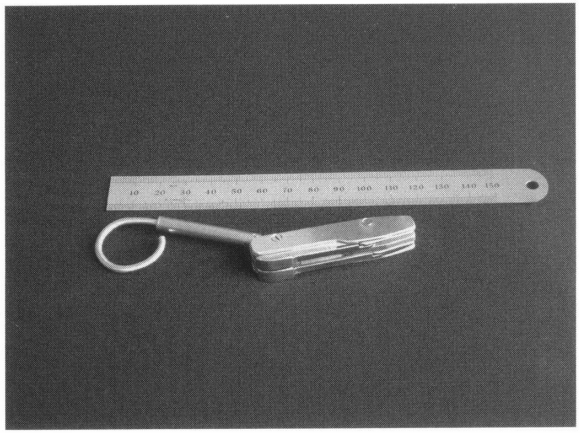

Fig. 1. Dundee Multitool in the closed position.

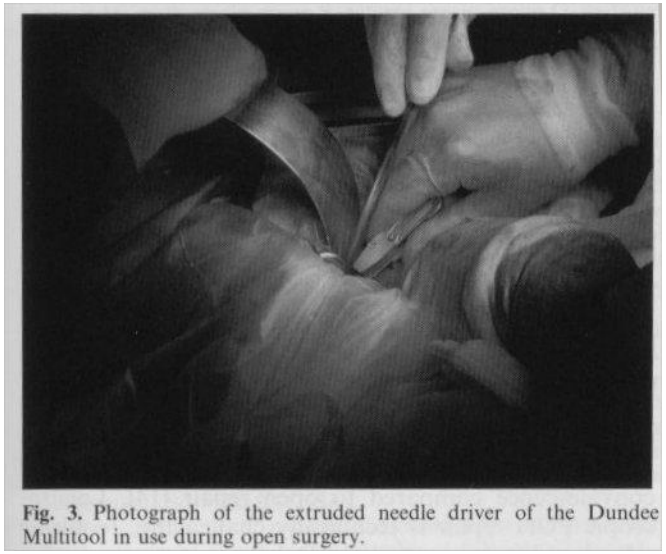

Fig. 3. Photograph of the extruded needle driver of the Dundee Multitool in use during open surgery.

Hand-assisted Laparoscopic Colectomy

Potential Advantages

- Decrease OR time
- Ability to overcome intra-op difficulties
- Reduction of conversion to open
- Shorter learning curve for surgeons

Hand-assisted Laparoscopic Colectomy

Potential Disadvantages

- Loss of advantages of pure laparoscopic approach
- Treatment of patients inappropriately with laparoscopy

Hand-assisted Laparoscopic Colectomy

Conclusions

- Offers similar outcomes to laparoscopic
- May be a bridge to laparoscopic technique
- Brings more difficult cases into the realm of minimally invasive surgery