



Laparoscopic Ultrasound is still useful in the era of modern imaging

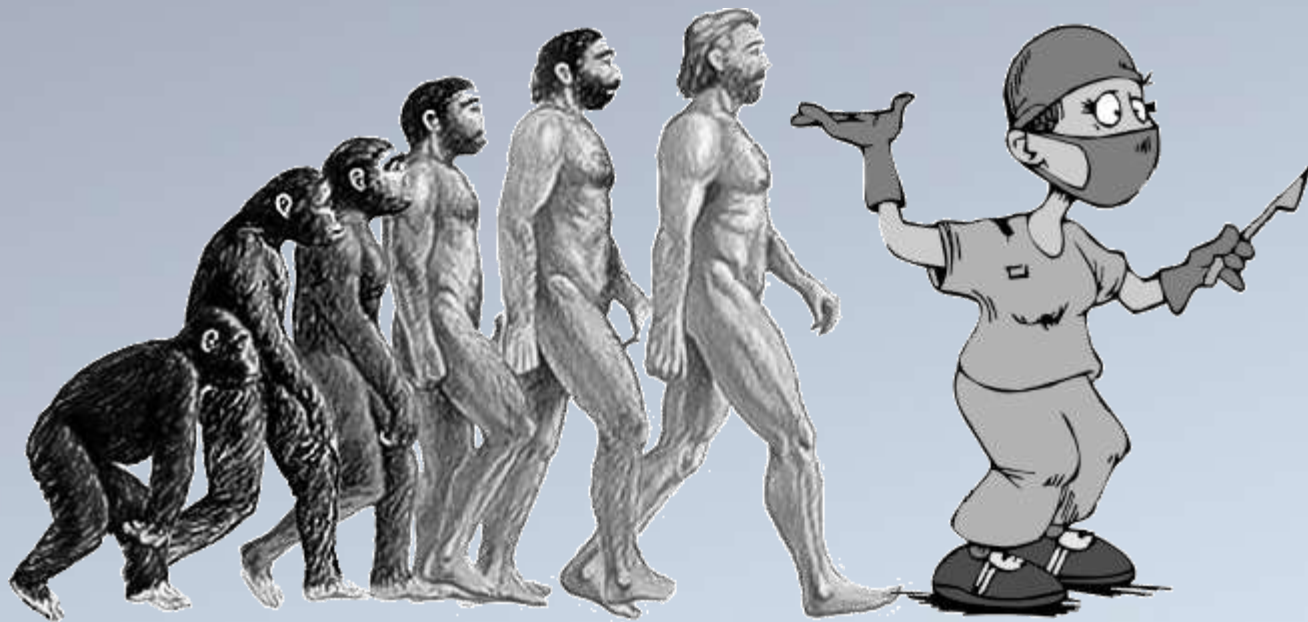
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Background

- Historically, futile laparotomies have been common in liver surgery
- This was due to insufficient pre-operative staging
- Laparoscopy and Laparoscopic Ultrasound (LUS) lowered the numbers of futile laparotomies

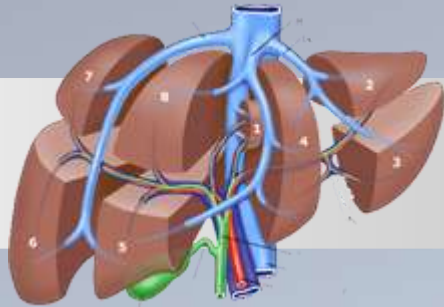
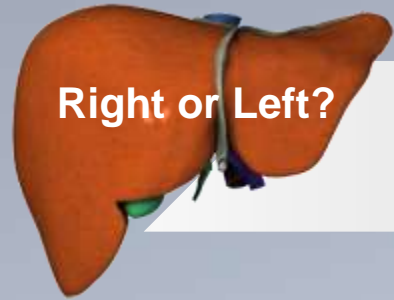
Evolution of Liver Surgery



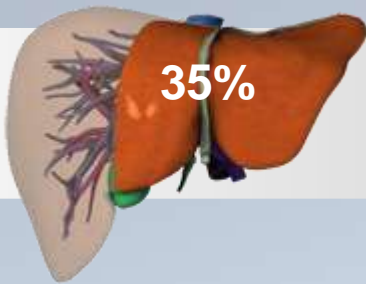
Evolution of Liver Surgery



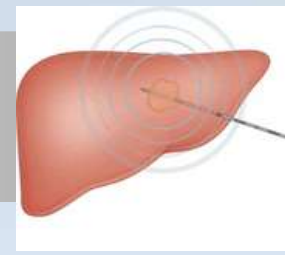
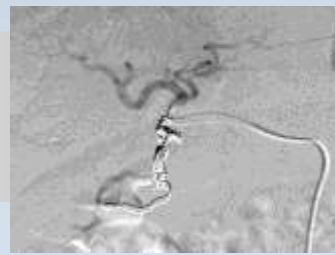
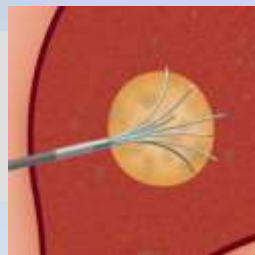
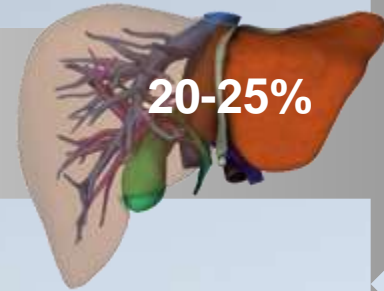
Right or Left?



35%



20-25%





Modern Liver Surgery

- Better surgical techniques allows to resect lesions earlier found to be non-resectable
- Better peri-operative treatment allows for larger resections



- Increased indications for resection & decreased non-resectable lesions
- This makes older studies on imaging obsolete



"Modern" Evidence for LUS

- Randomized trials
- Comparative studies
- Studies on ablation





Recent LUS Results

Author	Country	Type	Year	N	NL	NR	Impact
Salama et al (Lap.RFA)	Egypt	HCC+CRC	2010	72	18%	-	18%
Skrovina et al (Lap. colon resect.)	Czech Rep.	CRC	2008	70	11%	-	11%
Cassacia et al (Lap.RFA)	Italy	CRC	2008	24	20%	-	20%
Piccolboni et al	Italy	CRC	2008	77	-	19%	19%
Mann et al	UK	CRC	2007	200	-	10%	10%
Pilkington et al	UK	CRC	2007	77	-	21%	21%
Mortensen et al	Denmark	CRC	2006	45	7%	2%	2%

NL: New lesions detected

NR: Non-resectable lesions

Impact: Change in planned treatment



Does LUS equals IOUS?

- No trials directly compares LUS and IOUS
- Few studies with both IOUS and LUS
- IOUS seems to detect more metastasis than LUS, but the difference seems low
- If you find indication for IOUS in open surgery, there is indication for LUS in laparoscopic surgery?

How about IOUS?

Author	Country	ST	Type	Year	N	NL	NR	Impact
D'Hondt et al	Canada	P	HCC+CRC	2011	418	-	2%	17%
Wagnetz et al (sens.spec.)	Canada	R	HCC+CRC	2011	292	-	3%	-
Hata et al	Japan	R	CRC	2011	183	10-18%	-	10-18%
Van Vledder et al	USA	P	CRC	2010	213	10%	-	9%
Sietses et al	Netherlands	P	CRC	2010	100	23%	-	30%
Wu et al	Singapore	R	HCC	2010	50	-	-	18%
Pazaiti et al	Greece	R	HCC+CRC	2009	92	16%	-	27%
Mazzoni et al	Italy	P	CRC	2008	167	-	-	17%
Wildi et al	Switzerland	R	CRC	2008	31	-	-	35%
Wiering et al	Netherlands	P	CRC	2007	131	-	19%	21%
Ellsmere et al	USA	P	HCC+CRC	2007	50+50	14-20%	-	20%
Torzilli et al	Italy	P	HCC	2007	87	33%	-	-

ST: Study Type: P Prospective R Retrospective

NL: New lesions detected

NR: Non-resectable lesions

Impact: Change in planned treatment



Impact of IOUS

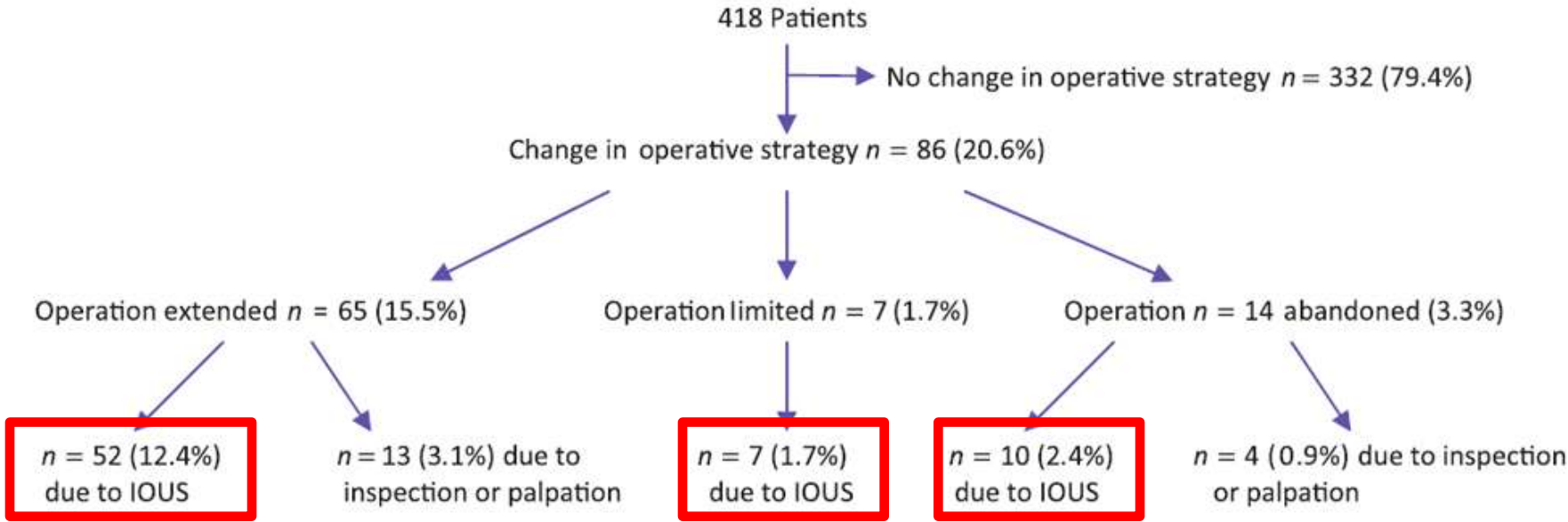


Figure 1 Impact on operative strategy

Is intra-operative ultrasound still useful for the detection of a hepatic tumour in the era of modern pre-operative imaging?

17%

Mathieu D'Hondt¹, Franck Vandenbroucke-Menu¹, Sébastien Préville-Ratelle¹, Simon Turcotte¹, Miguel Chagnon², Marylène Plasse¹, Richard Létourneau¹, Michel Dagenais¹, André Roy¹ & Réal Lapointe¹



Guidelines?

- Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)
- Guidelines for the use of LUS in Liver Disease (2009)
 - The benefits of LUS are:
 - Identification of further lesions
 - Identification of the extent of tumors
 - Avoid unnecessary surgery
 - change the management in 49%



Current use of LUS?

1: LUS is useful in most laparoscopic procedures
2: LUS provides added value during laparoscopic

	Procedures in which LUS is used currently <i>n</i> (% in sample)	Procedures in which LUS can be useful <i>n</i> (% in sample)	urgical precision of urgical safety perating time sufficient n LUS is difficult difficult aging data of palpatory
All respondents	76 (43)	142 (80)	
Procedures related to ^a			
Liver	51 (67)	119 (84)	
Pancreas	23 (30)	69 (49)	
Biliary tract	16 (21)	54 (38)	in a satisfactory
Colon/rectum	12 (16)	39 (27)	is uncomplicated
Adrenal	3 (4)	24 (17)	se
Other	10 (13)	71 (50)	

Laparoscopic ultrasound: a survey of its current and future use, requirements, and integration with navigation technology

Cecilie Våpenstad · Anna Rethy · Thomas Lango ·
Tormod Selbekk · Brynjulf Ystgaard ·
Toril A. Nagelhus Hernes · Ronald Mårvik



Does LUS have a future?

- Increase in laparoscopic surgery
- LUS guided treatment
- Survey: 82% were positive towards increased use of LUS in 5 years time





In Conclusion

- Limited recent LUS-specific evidence
- For IOUS the detection of non-resectable disease has decreased
- The reported impact of LUS (and IOUS) is ~20%
- Laparoscopic liver surgery without LUS may lead to insufficient surgery



**If you don't look for it,
you won't find it!**



Thank you for your attention