Robotassisteret pancreaskirurgi

Torsdag d. 5/3 2026, Rigshospitalet

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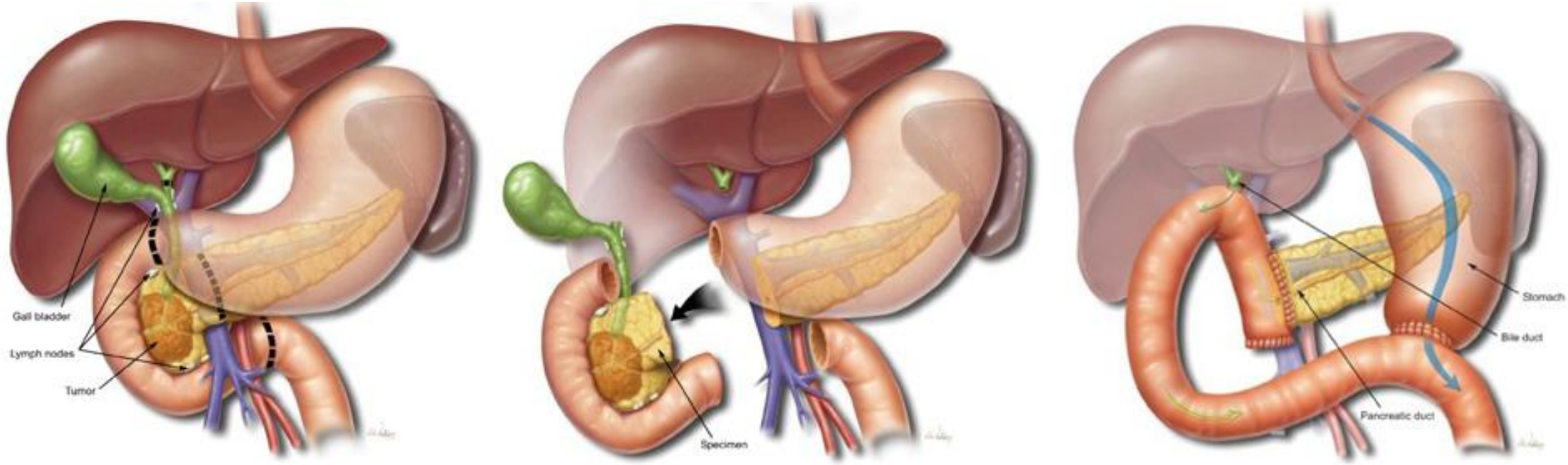
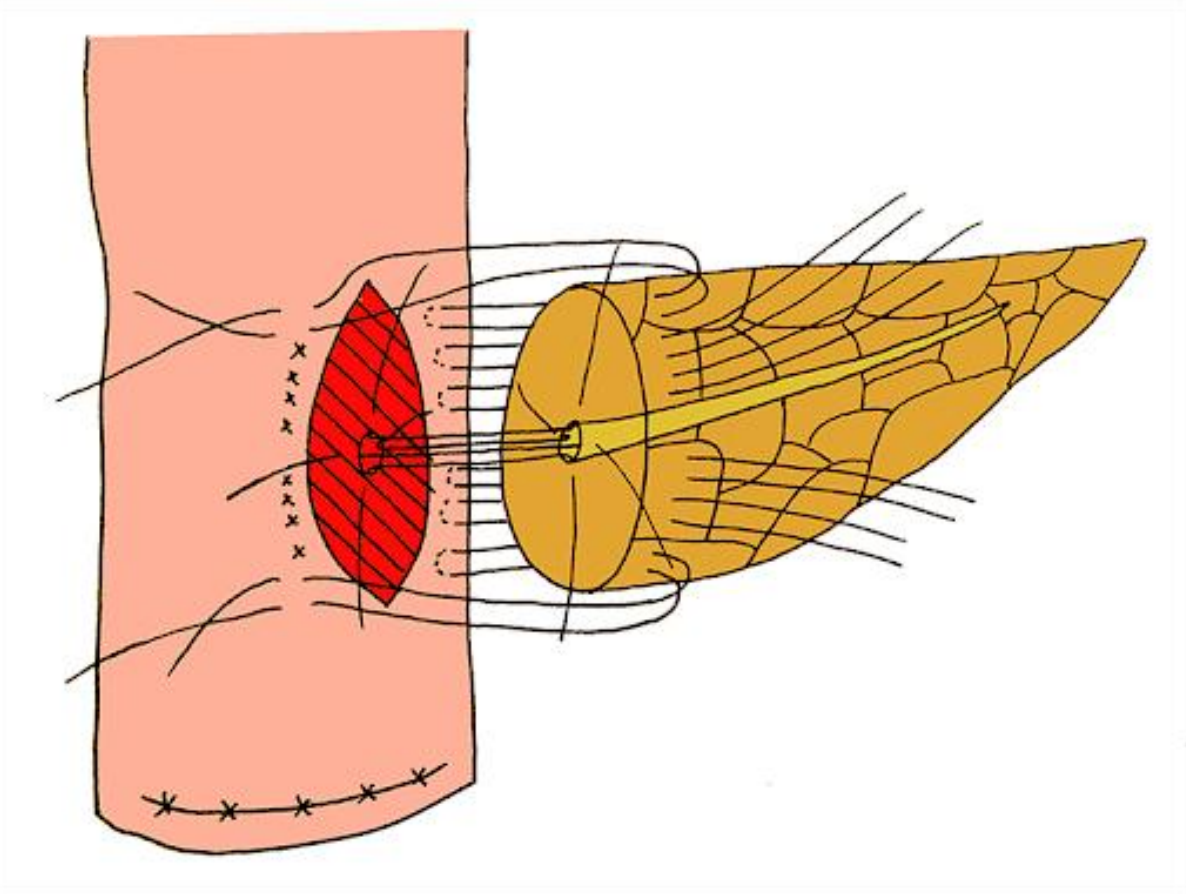
pancreas cancer – whipples operation

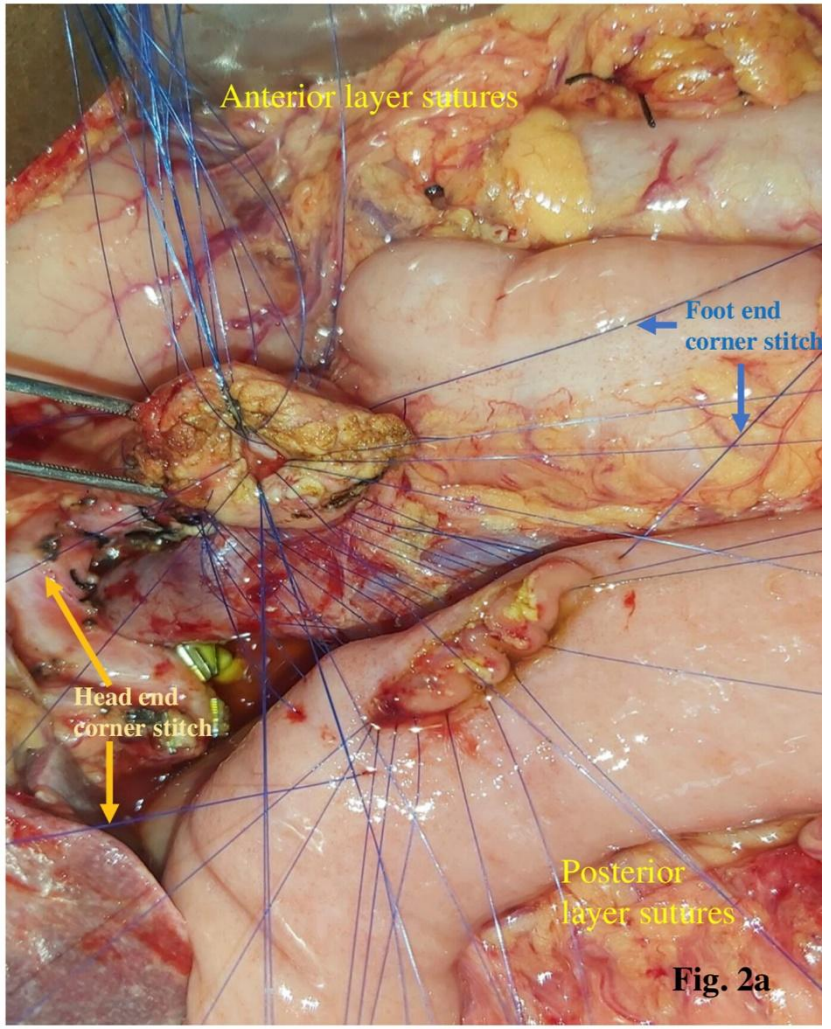


whipples operation

- åben operation (robot-ass.)
- 3-6 timer
- median 800-1000 ml blødning (robot-ass. 100 ml)
- median indlæggelse 10-11 dage (åben)
- 40% risiko for komplikationer
- 10% risiko for pancreasfistel/lækage

pancreas-anastomose





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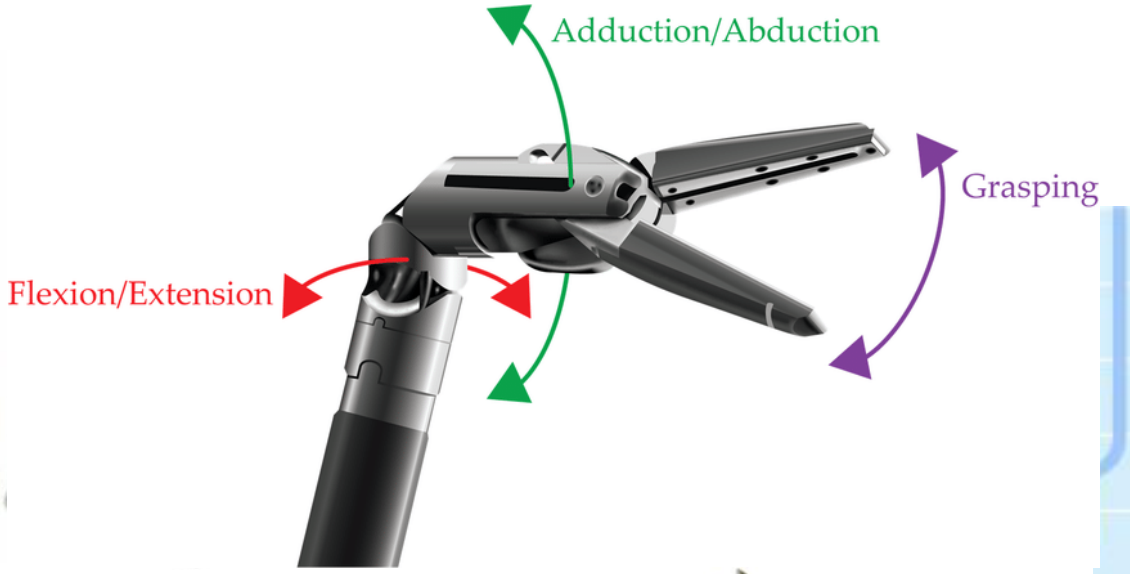
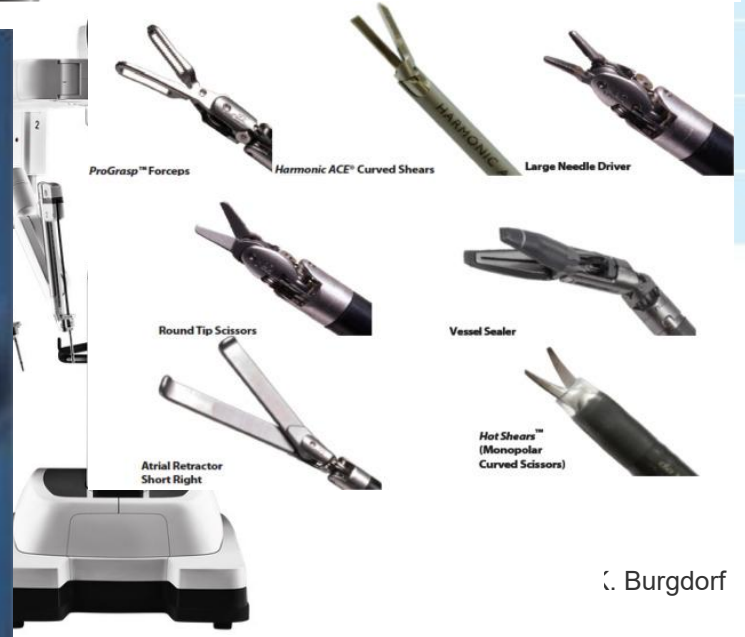
hvorfor robot-kirurgi?

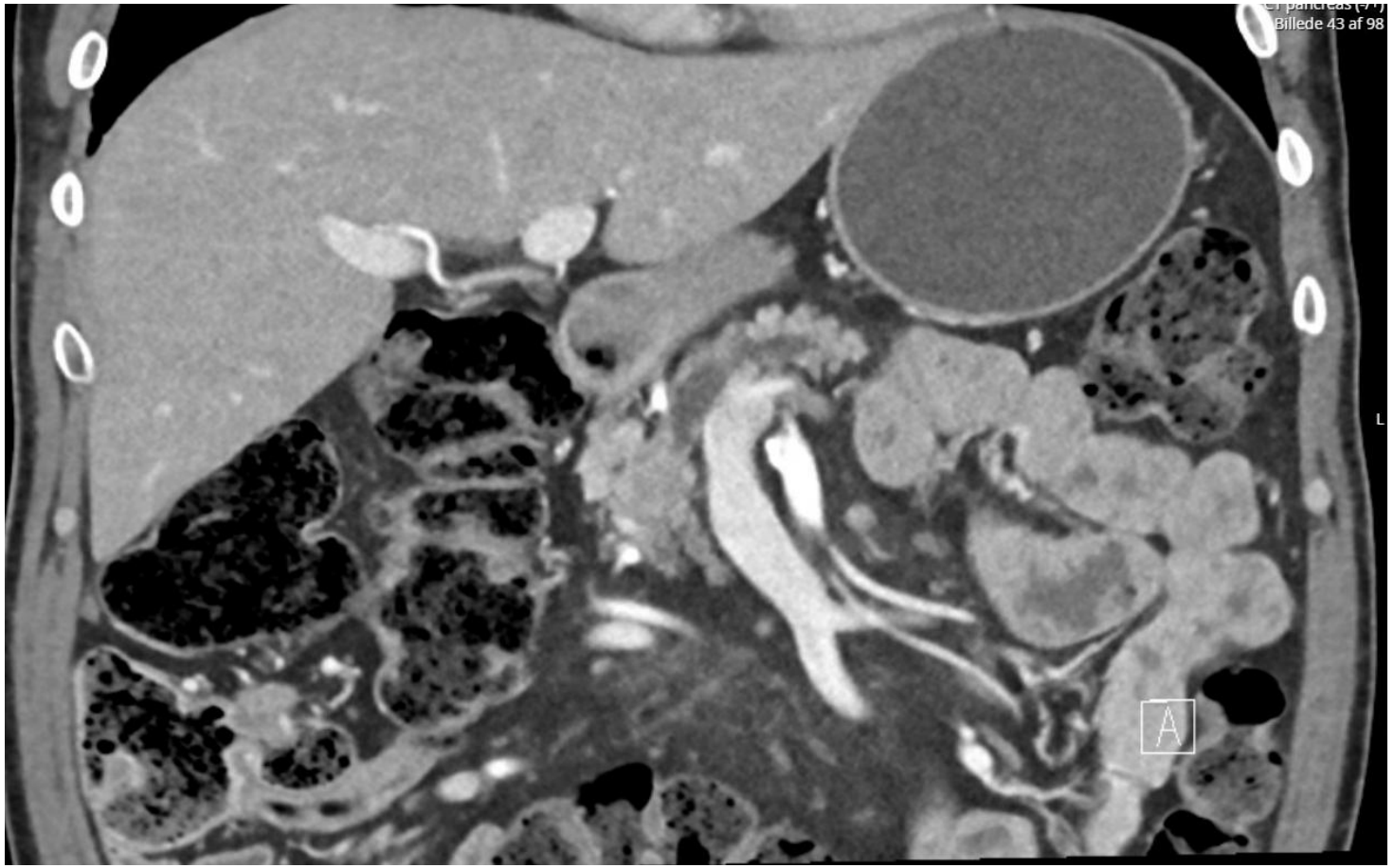
- ”håndled” – særligt vigtigt på ”fikserede organer” som pancreas og ved præcis suturering
- 3D billede med forstørrelse
- stillesiddende kamera
- bedre ergonomi





case

- 66 årig mand
- vægttab
- mavesmerter



postoperativt

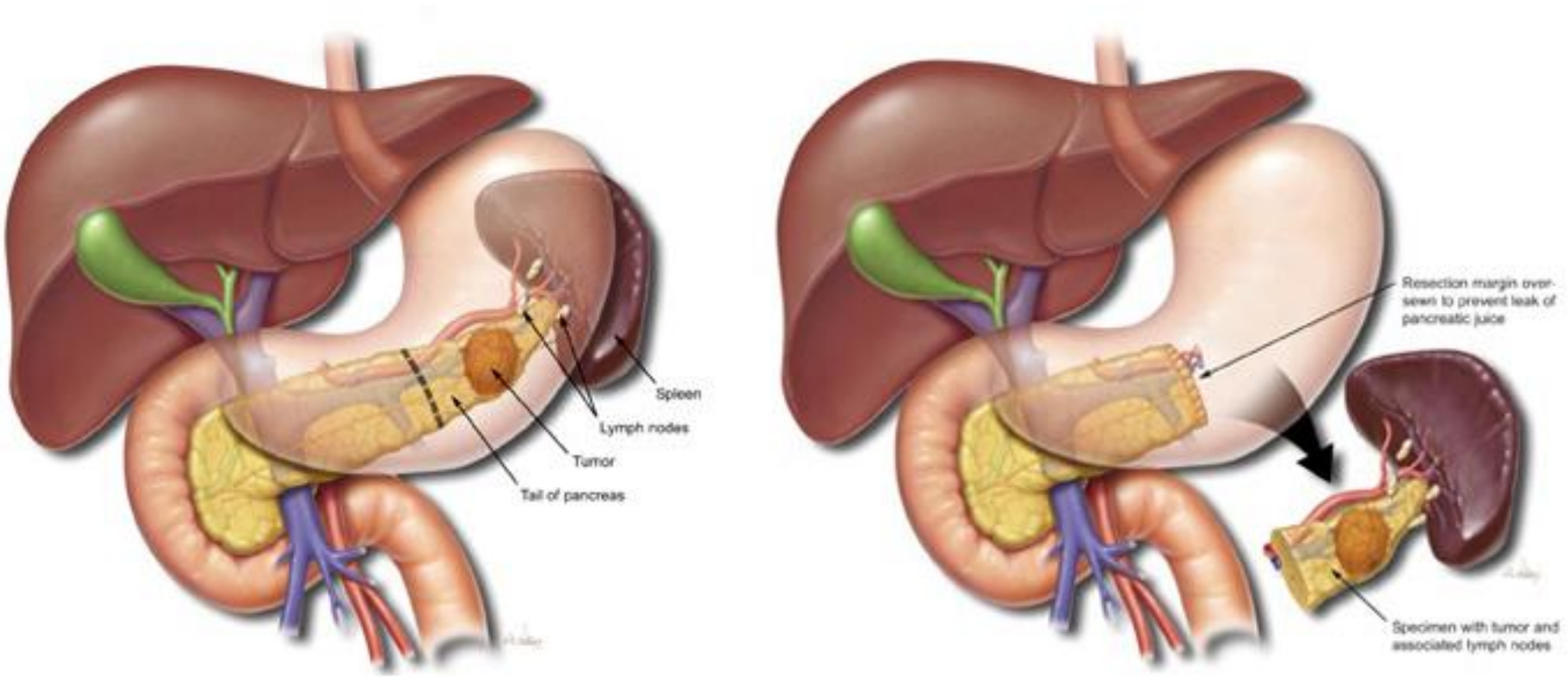
- knivtid 347 minutter
- EBL 350 ml

- ukompliceret postoperativt forløb, udskrevet POD 5
- histologi: PDAC T2N1

RCT minimal invasiv whipple

	study	approach	publication		
1	PLOT	LPD	BJS 2017	single center	India (Combaitore)
2	PADULAP	LPD	Ann Surg 2018	single center	Spain (Barcelona)
3	LEOPARD-2	LPD	Lancet Gas-Hep 2019	multicenter	The Netherlands
4	MITG-P-CPAM	LPD	Lancet Gas-Hep 2021	multicenter	China
5	MITG-P-CPAM2	LPD	JAMA Surg 2023	multicenter	China
6	K-MIPS	LPD	Int J Surg 2024	multicenter	Korea
7	EUROPA trial	RPD	Lancet RHE 2024	single center	Germany (Heidelberg)
8	Liu trial	RPD	Lancet Gas-Hep 2024	multicenter	China
9	PORTAL trial	RPD	unpublished	multicenter	China
10	DIPLOMA-2	RPD/LPD	unpublished	multicenter	Europe
11	DIPLOMA-2x2	RPD	ongoing	multicenter	Europe

venstresidig (distal) pancreasresektion



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venstresidig pancreasresektion

- åben, laparoskopisk, robot-assisteret
- 2-4 timer
- median 200-400 ml blødning (robot-ass. 50-100 ml)
- median indlæggelse 4-7 dage (åben)
- 20 % risiko for pancreasfistel

evidens

- LEOPARD, LAPOP, DIPLOMA (minimal invasive vs. open)

- A. Giani, T. van Ramhorst, M. Mazzola et al. Benchmarking of minimally invasive distal pancreatectomy with splenectomy: European multicentre study, BJS 2022,1-7

- P. Müller, E. Breuer, F. Nickel et al. Robotic distal pancreatectomy, a novel standard of care? Benchmark values for surgical outcomes form 16 international expert centers, Ann of Surgery 2022

evidens

- sammenlignet med åben:
  - færre komplikationer
  - kortere indlæggelse
- sammenlignet med laparos
  - lavere konverteringsrate

Table 3: Comparison of Benchmark values with 3 different cohorts.

Benchmark cutoffs	Non-benchmark robotic DP (n=455)	Laparoscopic DP (n=181)	Open DP°	Robotic DP benchmark cutoff
Operation time (min)	250	209	226*	≤300min
Estimated blood loss (ml)	150	200	712*	≤150ml
Conversion to open (%)	5.7	14.9	-	≤3%
Complications at 3 months (%)	42.7	62.4	57*	≤58.3%
Major complications (≥3) (%)	23.3	22.1	17*	≤26.7%
CCI at discharge	0	8.7	8.7**	≤8.7
CCI at 3 months	0	8.7	n.a.	≤8.7
Pancreatic fistula (B&C) (%)	21.9	21.0	18*	≤31.8%
Delayed gastric emptying (%)	5.6	7.1	4.8°°	≤5%
Postoperative hemorrhage (%)	3.1	3.3	3.5**	≤6.6%
ICU stay (days)	1	0	n.a.	≤1 day
Length of stay (days)	6	7	9.2*	≤7 days
Readmission rate (%)	19.1	14.4	24.4***	≤24%
Oncologic outcomes				
Number of resected LN (n)	14	10.5	9.4°°°	≥9
R0-resection *(malignant only)* (%)	86.8	84.5	92*	≥83%

CCI®: Comprehensive complication index; ICU: intensive care unit
°data retrieved from historical cohorts as follows: *Kooby et al. **Lovasik et al. °°Kleeff et al. *** Korrel et al.°°°Baker et al.

Spørgsmål?