



# **Cholecystectomy, splenectomy per principle?**

## **What to take into considerations?**

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# Disclosures

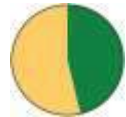
**The authors have no conflicts of interest and no financial relationships to  
disclose**

# Incidence

- Cholecystectomy – Splenectomy -

## Charité Universitätsmedizin Berlin (1997 - 2016)

- Cholecystectomy                      46.2 %    (189 / 409)
- Splenectomy                            23.0 %    (94 / 409)



## Why do we perform Cholecystectomy ?



Alla Ilyinichna Levushkina

## Why do we perform Splenectomy ?

## **Why do we perform Cholecystectomy ?**

- **Tumor involvement**
- **Cholecystolithiasis**
- **Risk of Cholecystitis after HIPEC (prevention)**

## **Why do we perform Splenectomy ?**

- **Tumor involvement**
- **Due to injury/bleeding**

# Literature review

- *Cholecystectomy* -

Is cholecystectomy and removal  
of the round ligament of the liver  
a necessary step in cytoreductive surgery  
and HIPEC, for peritoneal carcinomatosis?



*Ann. Ital. Chir.*, 2015 86: 323-326  
pii: S0003469X15023659

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# Results

## - Cholecystectomy -

Tumor origin	Patients with round ligament of the liver infiltration / total	Macroscopic vs. microscopic involvement	Patients with gallbladder infiltration / total	Macroscopic vs. microscopic involvement
Peritoneal pseudomixoma	16/20 (80%)	14 – 16	7/20 (35%)	5 – 7
Ovarian Cancer	32/66 (48.4%)	21 – 32	10/66 (15.1%)	7 – 10
Colorectal Cancer	21/42 (50%)	16 – 21	16/42 (38%)	14 – 16
Peritoneal mesothelioma	3/7 (42.8%)	3 – 3	1/7 (14.2%)	1 – 1
Gastric Cancer	2/10 (20%)	2 – 2	6/10 (60%)	5 – 6
Mucinous adenocarcinoma of the appendix	18/28 (64.2%)	24 – 18	12/28 (42.8%)	19 – 12
Various	2/7 (28.5%)	1 – 2	1/7 (14.2%)	1 – 1
TOTAL	94/180 (52.2%)		53/180 (29.4%)	

## Why do we perform Cholecystectomy ?

- Tumor involvement 29.4%
- **Cholecystolithiasis**
- Risk of Cholecystitis after HIPEC

## Why do we perform Splenectomy ?

- Tumor involvement
- Due to injury/bleeding



# Incidence of Cholelithiasis in patients with PSM

*- Literature review-*

## Charité Universitätsmedizin Berlin (1997 - 2016)

- No data

## Pubmed

- No data

# Incidence of Cholelithiasis in oncologic patients

*- Literature review-*

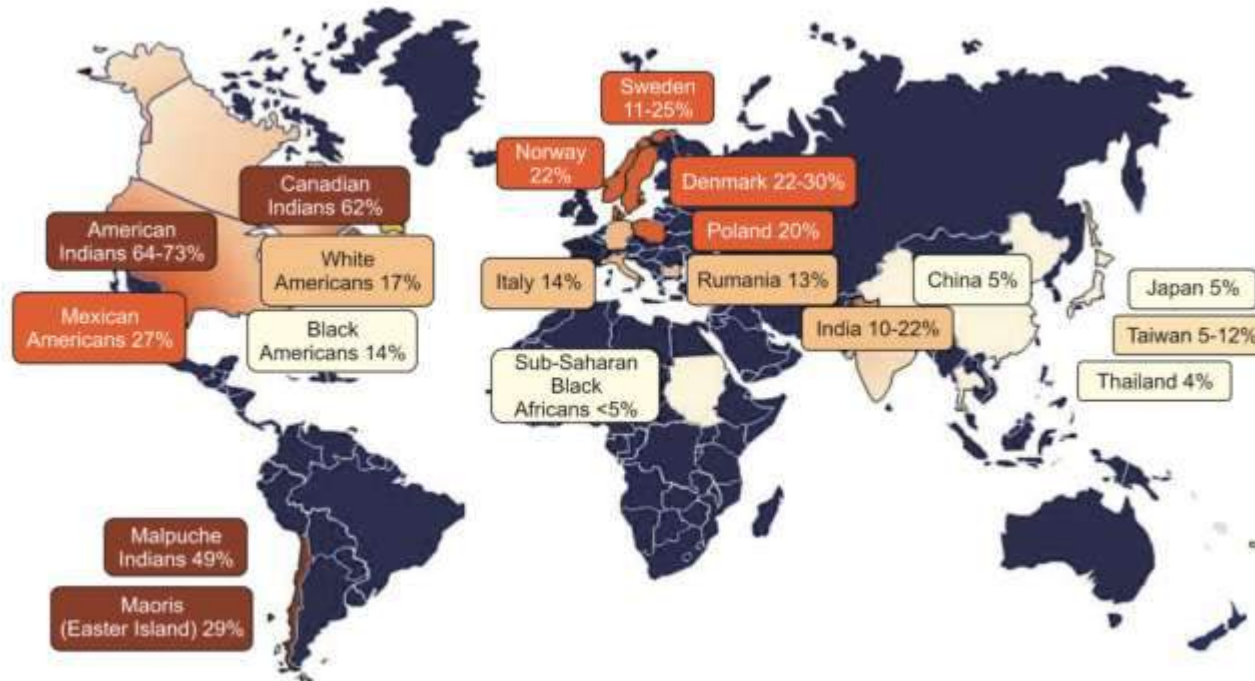
## Cholelithiasis development after surgery (Gastric Cancer)

- **7.2% (106/1,480 patients) median follow-up 47 months**
  - > **Cholecystitis 8.4% (9/106 patients); 0.6% total (9/1,480 patients)**
  - > **Common Bile Duct Stone Formation 1.4% (20/1,480 patients)**
- **7.4% (1,280/17,325 patients) gall stone disease**
  - 3.2% (560/17,325) cholecystectomy**
  - 1.8% (10/560) mortality**

# Incidence of Cholelithiasis in the world

- Literature review -

- in general 10-15%      80 % asymptomatic



## Why do we perform Cholecystectomy ?

- Tumor involvement 29.4%
- Cholecystolithiasis 7 – 15 %
- **Risk of Cholecystitis after HIPEC**

## Why do we perform Splenectomy ?

- Tumor involvement
- Due to injury/bleeding

# Cholecystitis after CRS & HIPEC

*- Cholecystectomy –*

## Charité Universitätsmedizin Berlin (1997 - 2016)

- No case

## Pubmed

- No data

**- Literature review, incidence, risk factors -**

- Park JG et. al. Clin Radiol. 2017 Mar 29. [Epub ahead of print]  
Paik KH et. al Medicine 2016; 95(15): 1-6  
Liang TJ et. al. Gastric Cancer 2017 Feb 2, [Epub ahead of print]  
Jayakrishnan TT et. al. Ann Surg Oncol 2014; 21(1): 240-7

# Simultaneous Cholecystectomy

*- Morbidity and Mortality -*

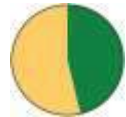
- **Gastric/Oesophageal Cancer:**
  - Late cholecystectomy 4.7%
  - Early postoperative cholecystectomy 1.2%
  - **Morbidity simultaneous 0.95%**
  - **Morbidity early and late CHE 0.45%**
- **Hepatocellular Carcinoma, left lateral (atypical) resection**
  - 74 with and 51 without simultaneous CHE
  - > higher complication rate

## Why do we perform Cholecystectomy ?

- Tumor involvement 29.4%
- Cholecystolithiasis 7 – 15 %
- Risk of Cholecystitis after HIPEC 0.02 – 7 %
- Higher morbidity compared to early/late CHE

### Charité Universitätsmedizin Berlin

- Cholecystectomy 46.2 % (189 / 409)





# Conclusions

- *Cholecystectomy per principle* -

- **Prophylactic Cholecystectomy is not generally recommended**
- **Individualised decision about Cholecystectomy**
- **Tumor infiltration underestimated in Ovarian Cancer and high incidence (>60%) in mucinous PSM**
- **Risk factors: Gastrectomy, Somatostatin Analogs, multikinase inhibitors**

## Why do we perform Cholecystectomy ?

- Tumor involvement
- Cholecystolithiasis
- Risk of Cholecystitis after HIPEC (prevention)

## Why do we perform Splenectomy ?

- Tumor involvement
- Due to injury/bleeding

# Splenectomy

- Literature review -

Ann Surg Oncol (2016) 23:1980–1985  
DOI 10.1245/s10434-016-5147-x

Annals of

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ORIGINAL ARTICLE – GASTROINTESTINAL ONCOLOGY

## Splenectomy Increases Postoperative Complications Following Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy

Francois Dagbert, MD<sup>1</sup>, Remy Thievenaz, MD<sup>1</sup>, Evelyne Decullier, PhD<sup>4</sup>, Naoual Bakrin, MD, PhD<sup>1,3</sup>, Eddy Cotte, MD, PhD<sup>1,3</sup>, Pascal Rousset, MD, PhD<sup>2</sup>, Delphine Vaudoyer, MD<sup>1,3</sup>, Guillaume Passot, MD, PhD<sup>1,3</sup>, and Olivier Glehen, MD, PhD<sup>1,3</sup>

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# Splenectomy

*- Literature review -*

- **July 2007 – July 2010**
- **Total 190 patients**
- **61 patients (32 %) Splenectomy**
- **Matched control group for gastrectomy, left pancreatectomy, and right and left diaphragmatic peritonectomy**  
**n=39 vs. n=39**

# Splenectomy

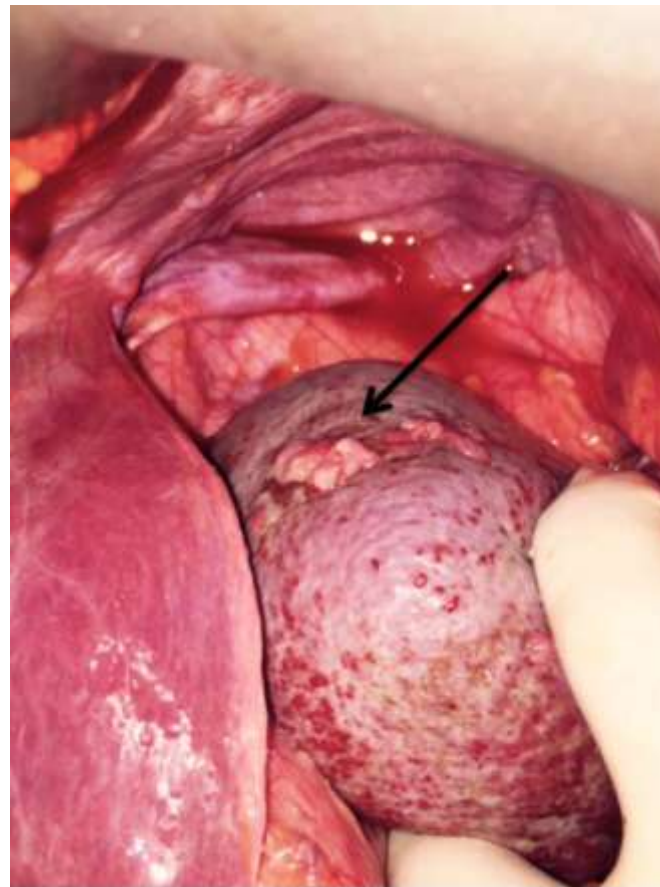
- Literature review -

	All patients n (%)	Splenectomy group n (%)	Control group n (%)	p value
Overall grade 3-4 complications	37 (47.4)	23 (59)	14 (35.9)	0.041
Abdominal complications	23 (29.5)	14 (35.9)	9 (23.1)	0.214
Pulmonary complications	19 (24.4)	16 (41)	3 (7.7)	0.0006
Infectious complications	22 (28.2)	12 (30.8)	10 (25.6)	0.615
Hematologic complications	12 (15.4)	6 (15.4)	6 (15.4)	1.000
30-day mortality	5 (6.5)	2 (5.1)	3 (7.9)	0.675

# Splenectomy

- *Literature review* -

- **Partial spleen capsulectomy**
- **Postoperative pancreatic fistula due to splenectomy**



## Why do we perform Cholecystectomy ?

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## Why do we perform Splenectomy ?

- Tumor involvement
- Due to injury/bleeding

# Iatrogenic Splenic Injury

- *Literature review* -

DE GRUYTER

Open Med. 2016; 11: 307-315

Review Article

Open Access

Alessandro Feola, Massimo Niola, Adelaide Conti, Paola Delbon, Vincenzo Graziano, Mariano Paternoster\*, Bruno Della Pietra

## Iatrogenic splenic injury: review of the literature and medico-legal issues

- 55 papers; 88 cases
- Mainly colonoscopy



# Iatrogenic Splenic Injury

*- Literature review -*

- **Risk factors**
  - **Previous surgeryadhesions**
  - **underlying pathology**
  - **morbid obesity**
  - **advanced age**
  - **location of primary incision (exposure of the left upper quadrant)**
  - **Open surgery**

# Iatrogenic Splenic Injury

*- Incidence - Colorectal Surgery -*

- **Merchea A. et. al.** **13,897 colectomies**  
**71 splenic injuries 0.42%**  
**44 (76%) required splenectomy**
- **Masoomi H. et. al.** **975,825 patients; period: 2006 – 2008**  
**splenic injury 0.96%**  
**84.75% treated with splenectomy**
- **Iatrogenic Splenic Injury 20% of all splenectomies in the US**

## Why do we perform Cholecystectomy ?

- Tumor involvement
- Cholecystolithiasis
- Risk of Cholecystitis after HIPEC (prevention)

## Why do we perform Splenectomy ?

- Tumor involvement                      no data, estimated 23 – 32 %
- Due to injury/bleeding                      0.42 – 0.96%

# Conclusions

*- Splenectomy per principle -*

- **Splenectomy is associated with higher morbidity (pulmonary complications, pancreatic fistula)**
- **Spleen preventive surgery recommend (Partial spleen capsulectomy)**



**Thank you for your attention**