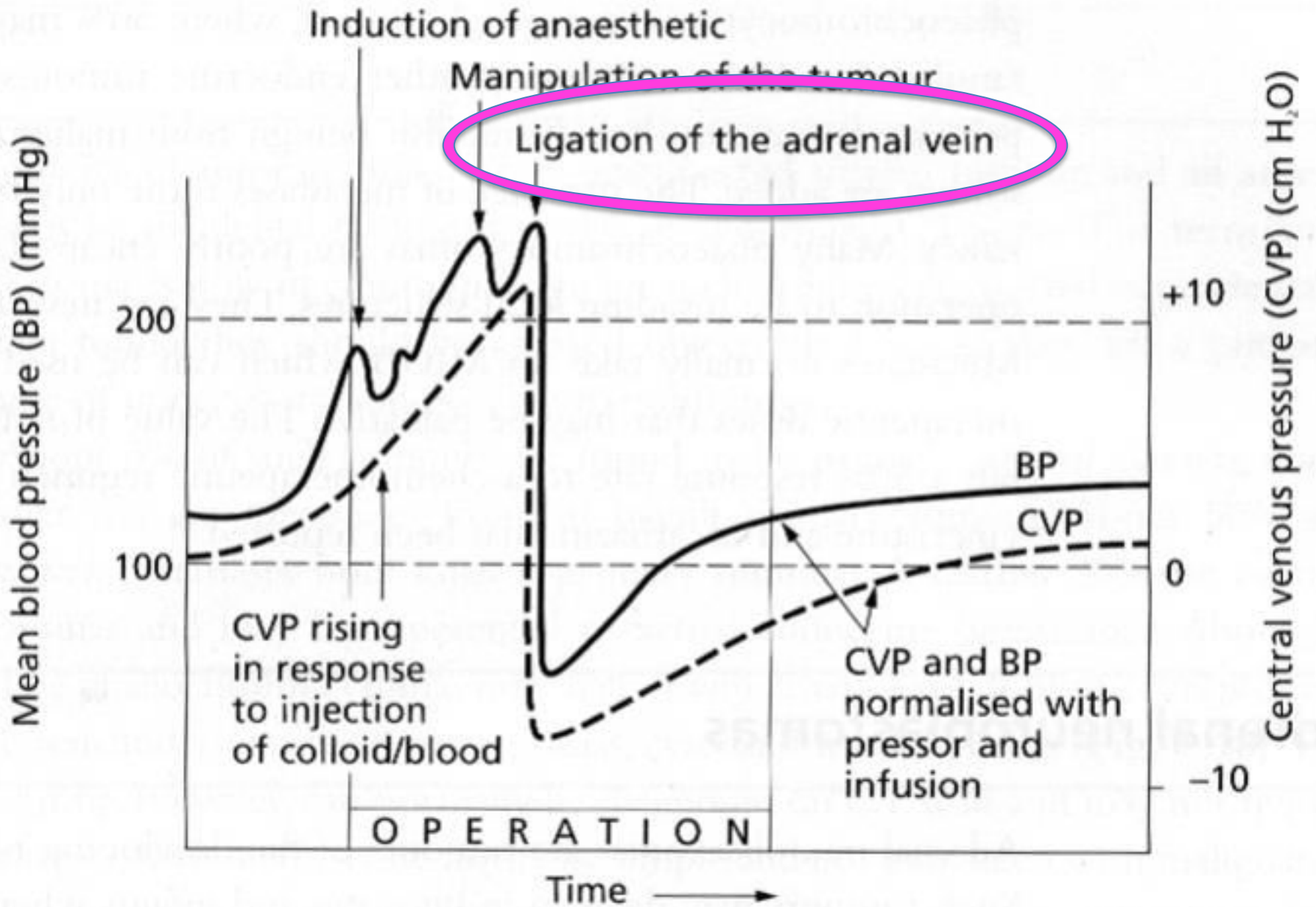


Metabolische Implikationen endokrin chirurgischer Eingriffe

Rupert Prommegger

Sanatorium Kettenbrücke-CSK
Innsbruck

ISDS Brac 2016





Endokrine Chirurgie

2 Erkrankungen

1. Tumor

2. hormonelles Syndrom

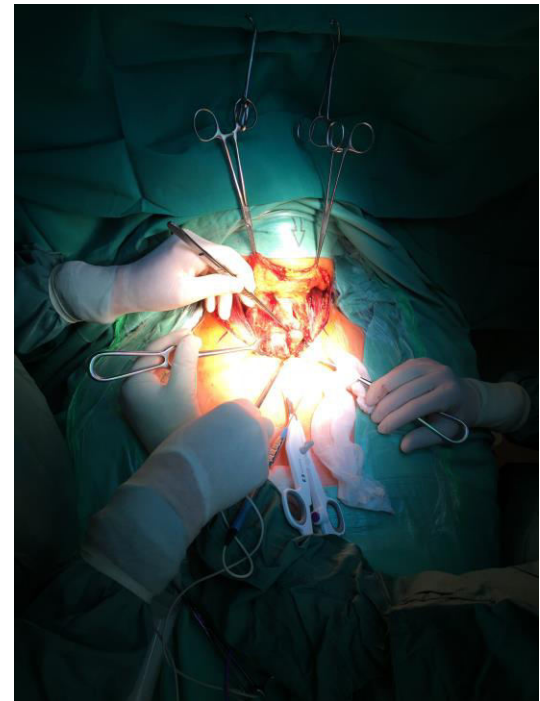


Schilddrüsenoperation

Maligne/Benigne

Thyroidektomie (TT)

Resektion (ST/HT/near total)





Vorteile der Totalen Thyroidektomie bei der gutartigen Struma

Standardisierte Operation

Bei SDCa keine Nachoperation

Vergessene Knoten

Keine Rezidive

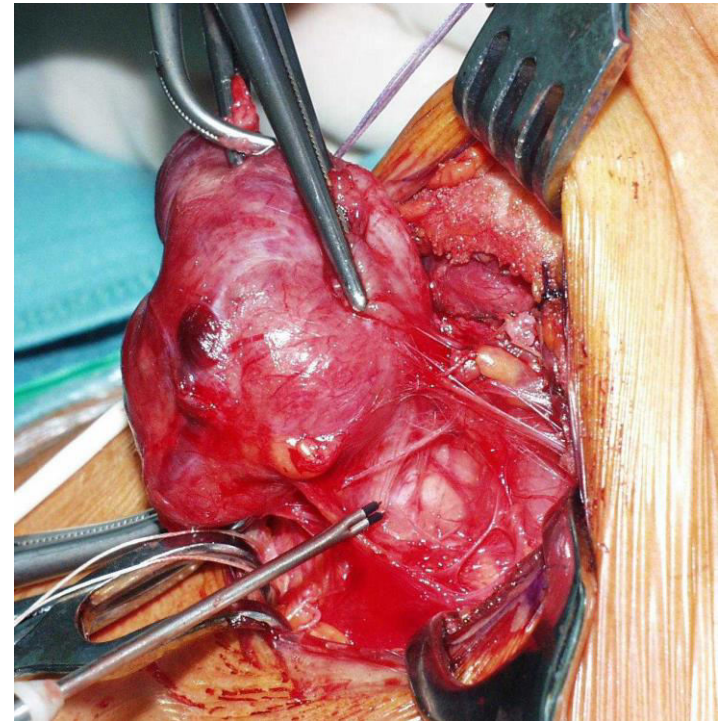




Nachteile der Totalen Thyroidektomie bei der gutartigen Struma

Erhöhte Hypoparararate

Abhängigkeit von SD Hormonen





Proargumente für totale Thyroidektomie beim Schilddrüsenkarzinom

Bessere Effizienz der Radiojodtherapie

Multizentrität des pap. SDCa

Thyreoglobulin -Tumormarker

Dedifferenzierung von Tumorlets

„subtotal thyroidectomy in thyroid carcinoma is for subtotal surgeons“

Sten Lenquist, Stockholm

Thyroidektomie

Postoperative Substitution

- HWZ von T4: 7 Tage
- OP:Hormoneinschwemmung
- Gewichtszunahme
- Resorption von T4 ?(PPI)

Thyroidektomie

ADD Syndrom

- **A**dynam
- **D**umm
- **D**ick



THYROID
Volume 21, Number 12, 2011
© Mary Ann Liebert, Inc.
DOI: 10.1089/thy.2011.0054

Weight Changes in Euthyroid Patients Undergoing Thyroidectomy

Jacqueline Jonklaas¹ and Hala Nsouli-Maktabi²

TABLE 2D. WEIGHT CHANGES AND BODY MASS INDEX CHANGES WITHIN PRIMARY CLINICAL GROUPS BY GENDER (FOR THYROIDECTOMY VS. HYPOTHYROID GROUPS)

| <i>Gender groups</i> | <i>Change in weight (kg)</i> | | | | <i>Change in BMI (kg/m²)</i> | | | |
|----------------------|-----------------------------------|-----------|---|-----------|---|-----------|----------------------------------|-----------|
| | <i>Thyroidectomy</i> | | <i>Hypothyroid</i> | | <i>Thyroidectomy</i> | | <i>Hypothyroid</i> | |
| | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> |
| Premenopausal women | 2.3 | 3.7 | 2.1 | 3.7 | 0.8 | 1.4 | 0.8 | 1.4 |
| Menopausal women | 4.4 | 2.9 | 2.6 | 2.3 | 1.7 | 1.2 | 1.0 | 0.9 |
| Men | 2.5 | 2.2 | 1.6 | 3.7 | 0.8 | 0.7 | 0.5 | 1.1 |
| Significance | <i>p</i> -value 0.0025 (ANOVA) | | <i>p</i> -value 0.14 (Kruskal–Wallis test) | | <i>p</i> -value 0.0004 (ANOVA) | | <i>p</i> -value 0.035 (ANOVA) | |



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|---------------------|---------------------------|-----|---------------------------------------|-----|------------------------------------|-----|--------------------------|-----|
| | Thyroidectomy | | Hypothyroid | | Thyroidectomy | | Hypothyroid | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Premenopausal women | 2.3 | 3.7 | 2.1 | 3.7 | 0.8 | 1.4 | 0.8 | 1.4 |
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Weight Changes in Euthyroid Patients Undergoing Thyroidectomy

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*TSH normal
postop Immobilität*

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|---------------------|---------------------------|-----|---------------------------------------|-----|------------------------------------|-----|--------------------------|-----|
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| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
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Endocrine (2015) 48:615–620
DOI 10.1007/s12020-014-0353-4

ORIGINAL ARTICLE

Post-thyroidectomy chronic asthenia: self-deception or disease?

Lodovico Rosato · Furio Pacini · Luca Panier Suffat ·
Guido Mondini · Adriana Ginardi · Maurizio Maggio ·
Maria Cristina Bosco · Carlo Della Pepa

n=200

1 Jahr postoperativ

A: Hemithyroidektomie
keine Asthenie

B: Totale Thyroidektomie
33% milde Asthenie



Post-thyroidectomy chronic asthenia: self-deception or disease?

Lodovico Rosato · Furio Pacini · Luca Panier Suffat ·
Guido Mondini · Adriana Ginardi · Maurizio Maggio ·
Maria Cristina Bosco · Carlo Della Pepa

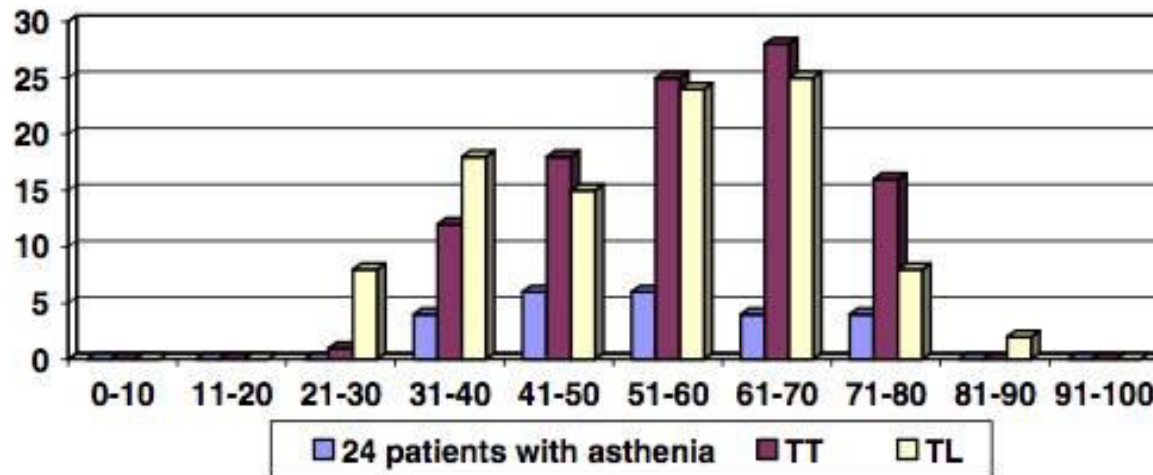


Fig. 1 Surgical patients distributed by age



Beschwerden durch die EX-Schilddrüse

Müdigkeit

Narbenprobleme

Schluckbeschwerden

Abgeschlagenheit

Gewichtszunahme

Kältegefühl

Ungeschicklichkeit

Postoperativer

Hypoparathyreoidismus

Gravierendste Komplikation der Schilddrüsenchirurgie



Nebenschilddrüsen kleinste Organe -
lebenswichtig !

1913

Mortalität der parathyreopriven Tetanie

25%

Gulecke, Neue d. Chir. Heft 19



permanenter manifester Hypoparathyreoidismus



Definition postoperativer Hypoparathyreoidismus????

Erniedrigtes PTH

Erniedrigtes Serum Kalzium

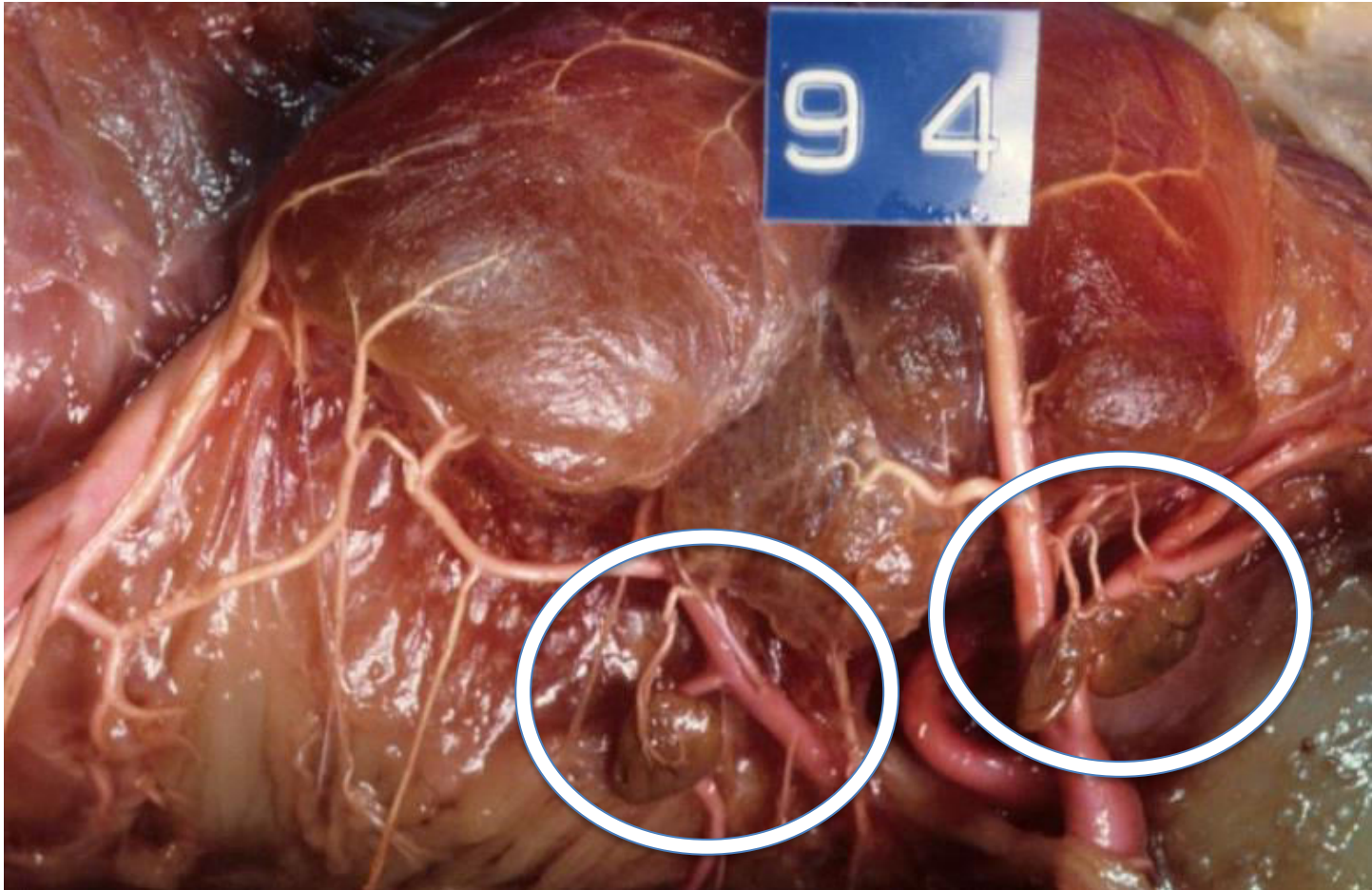
Symptome

10-35% passager (<6Mo)

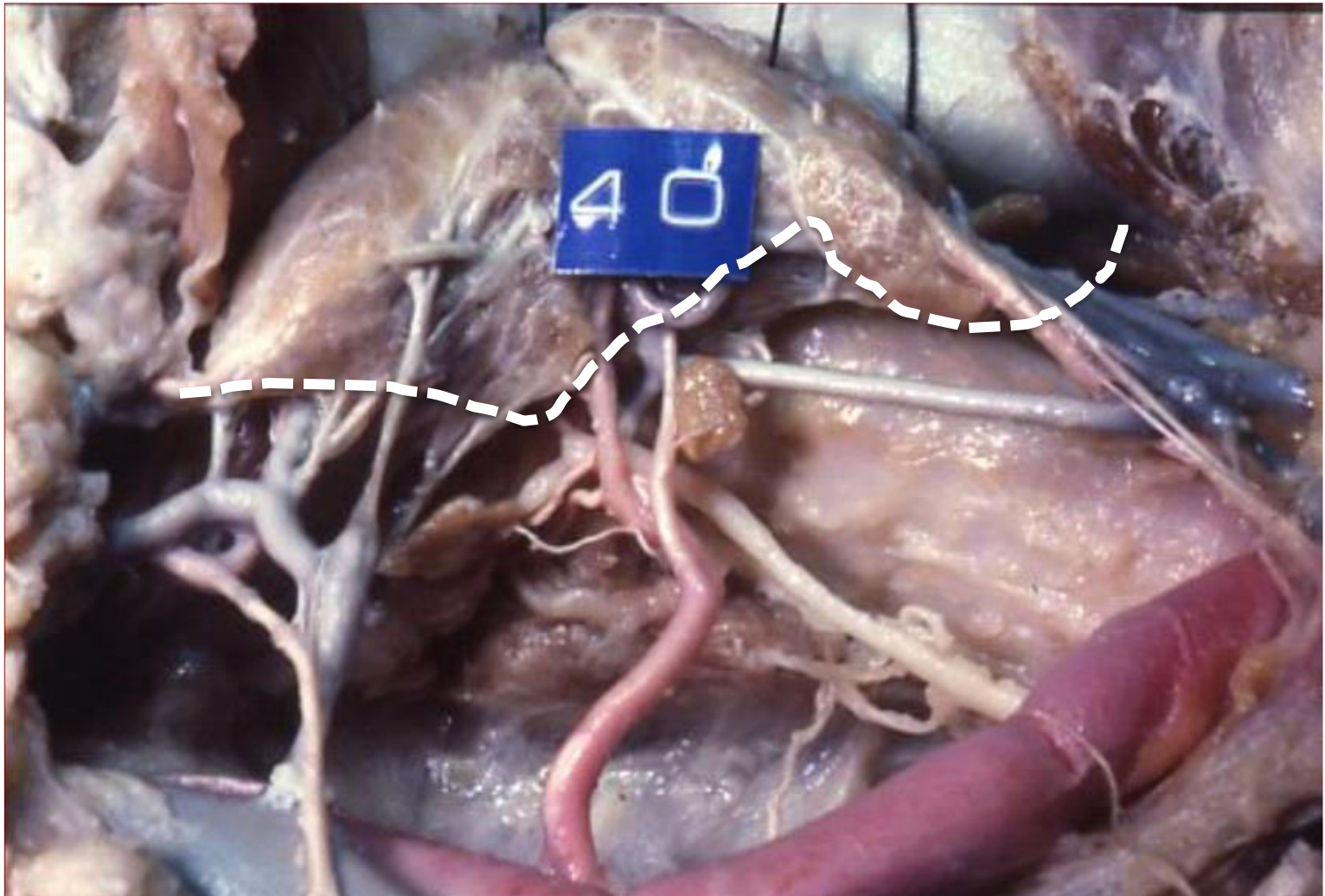
0,5-10% permanent (>6Mo) (permanent latent/manifest)

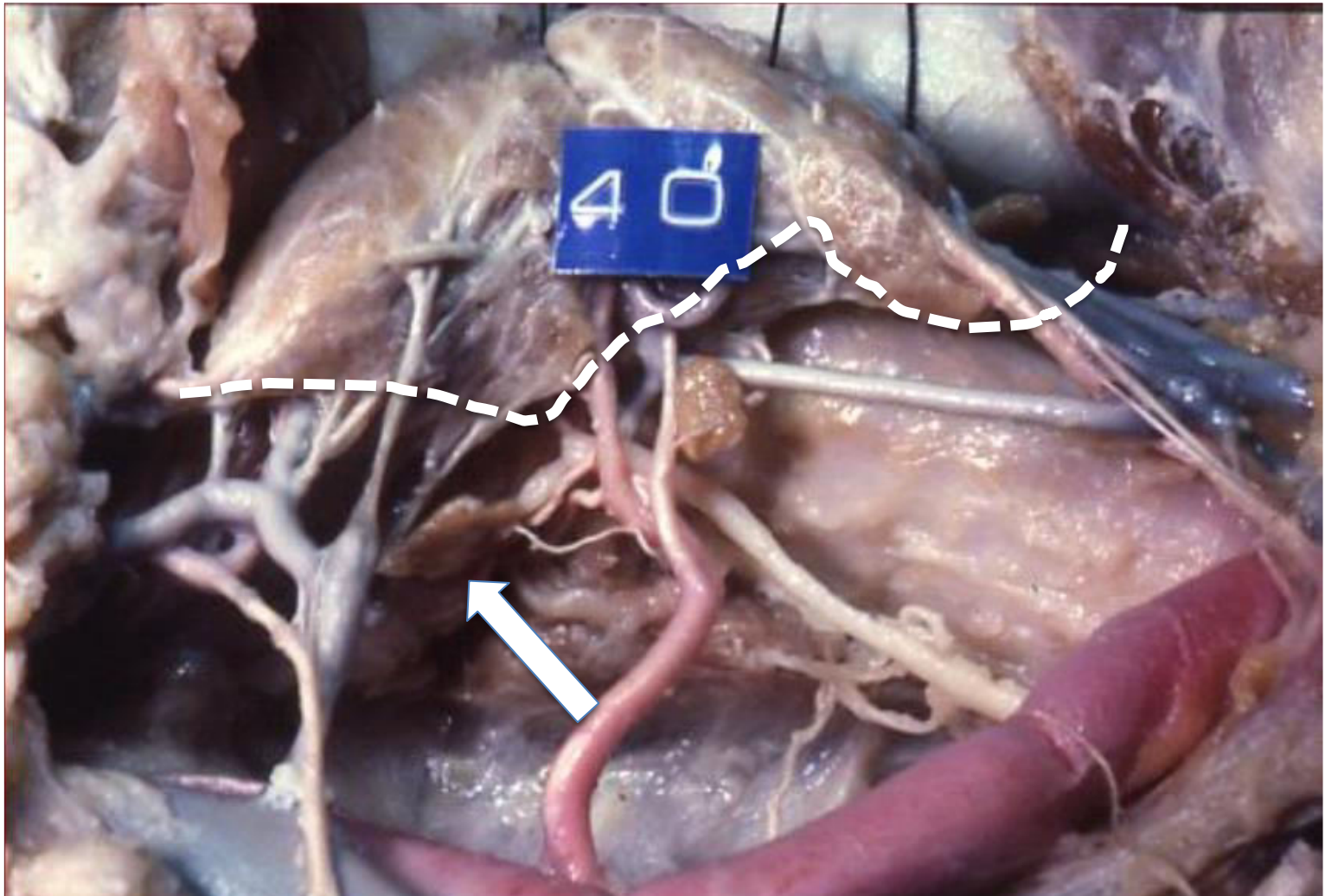


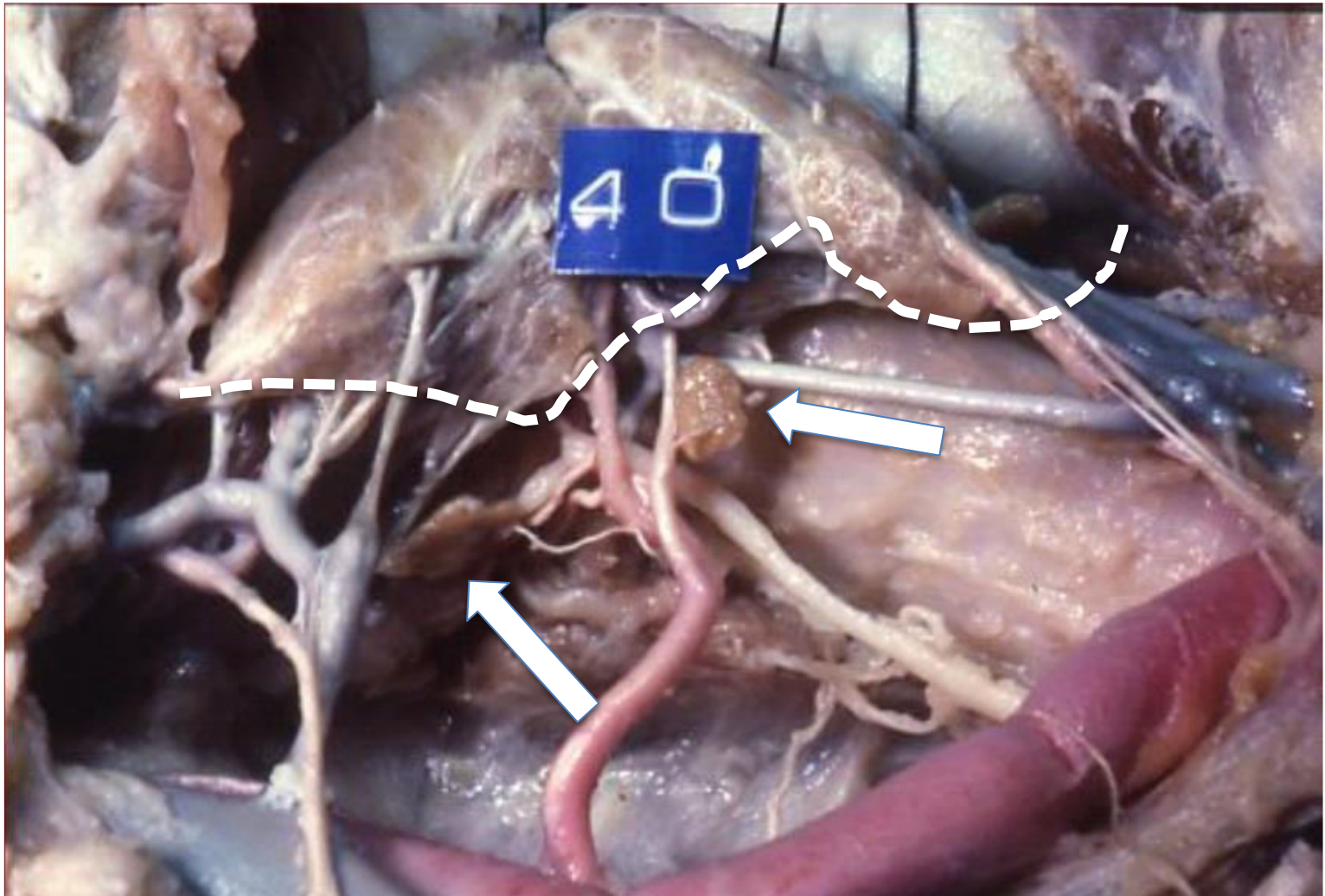
ISDS 2016 Brac

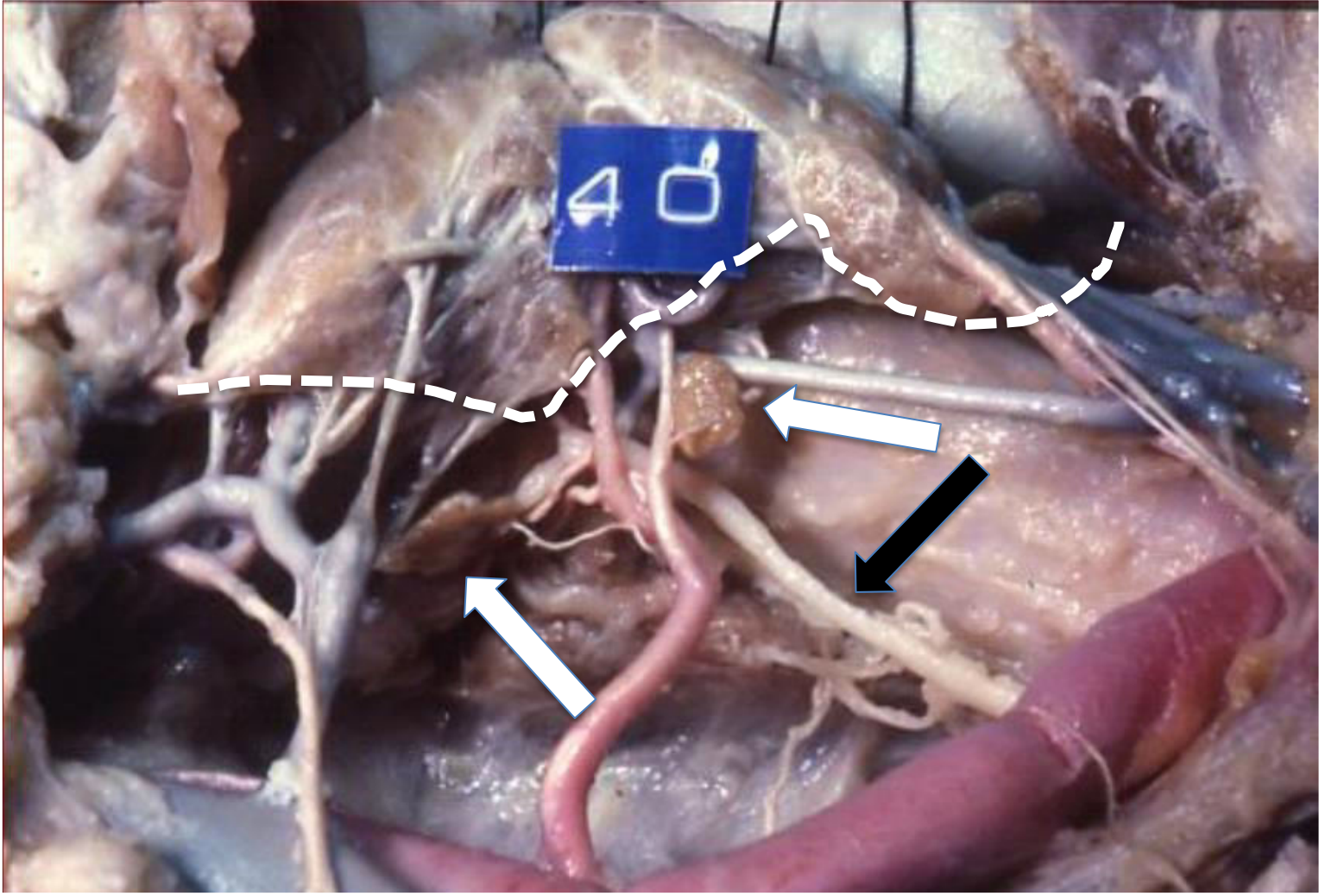


ISDS 2016 Brac

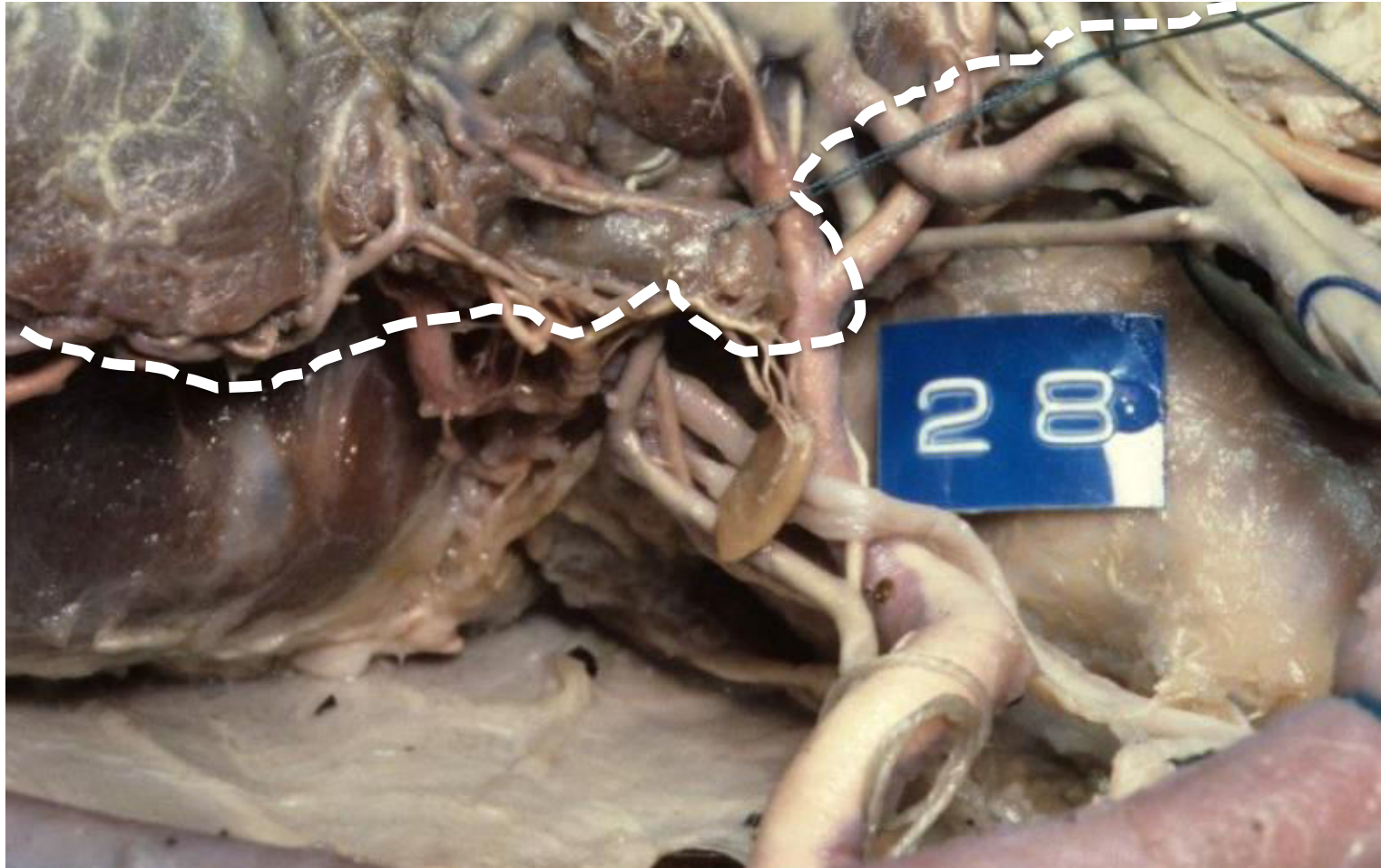






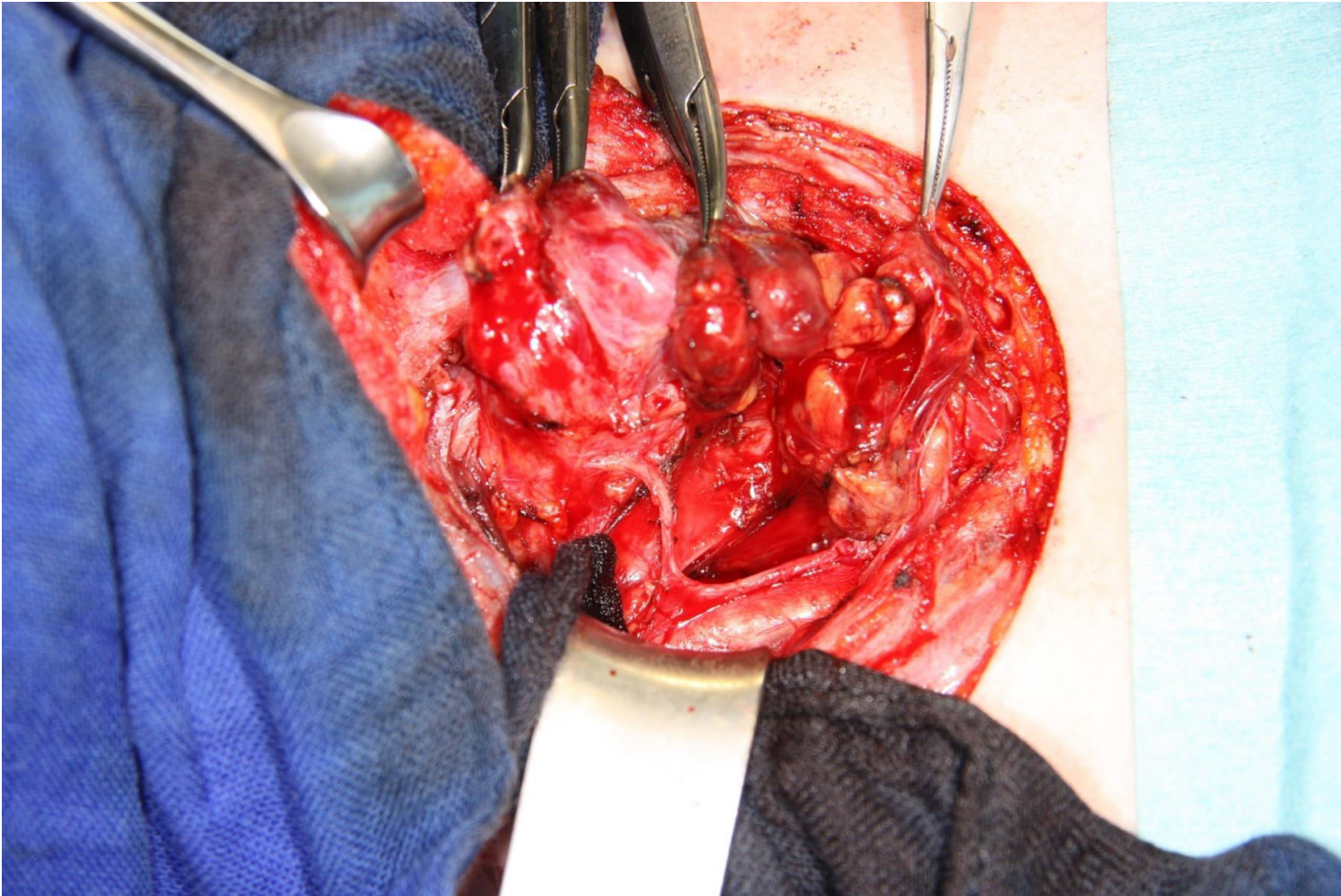




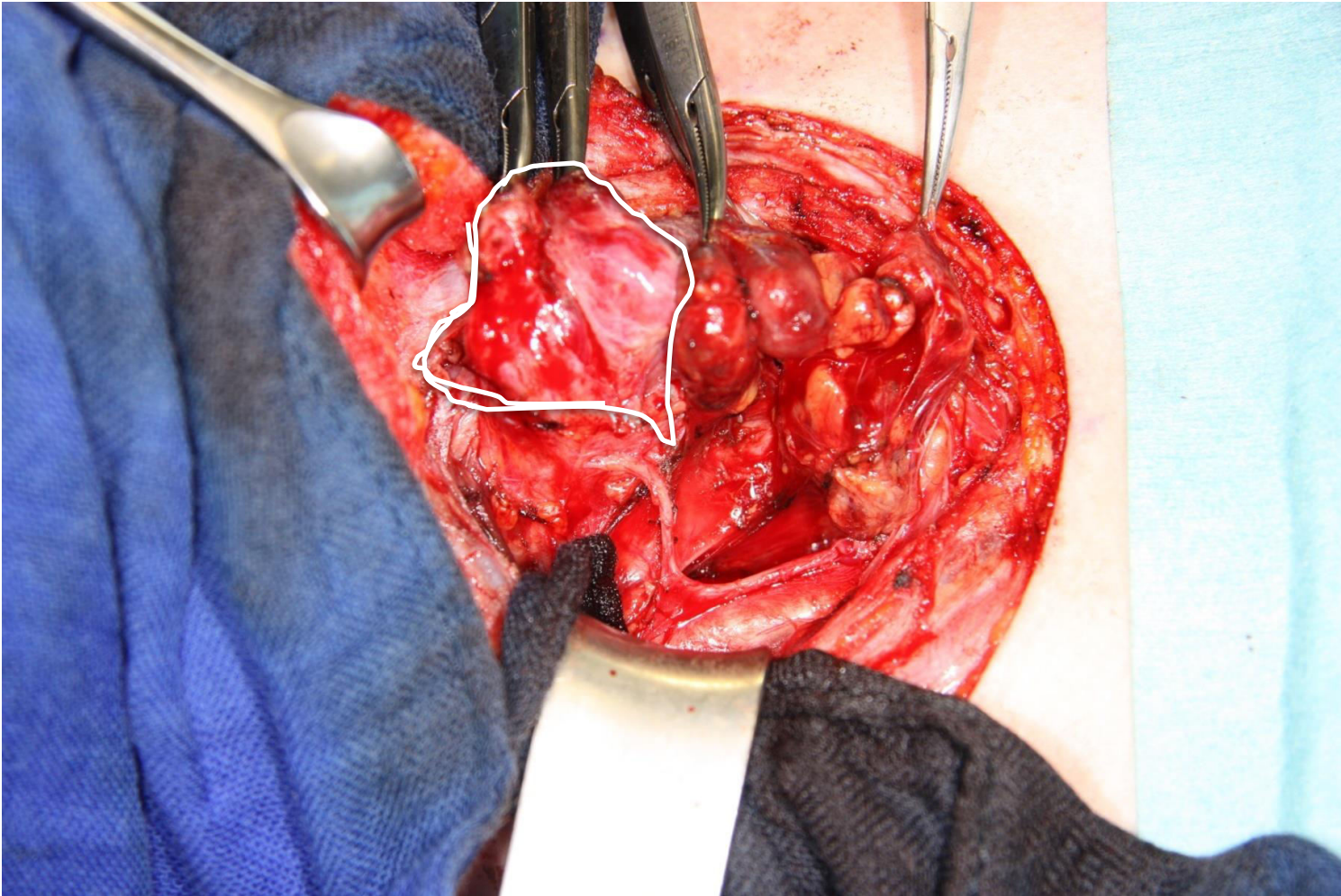


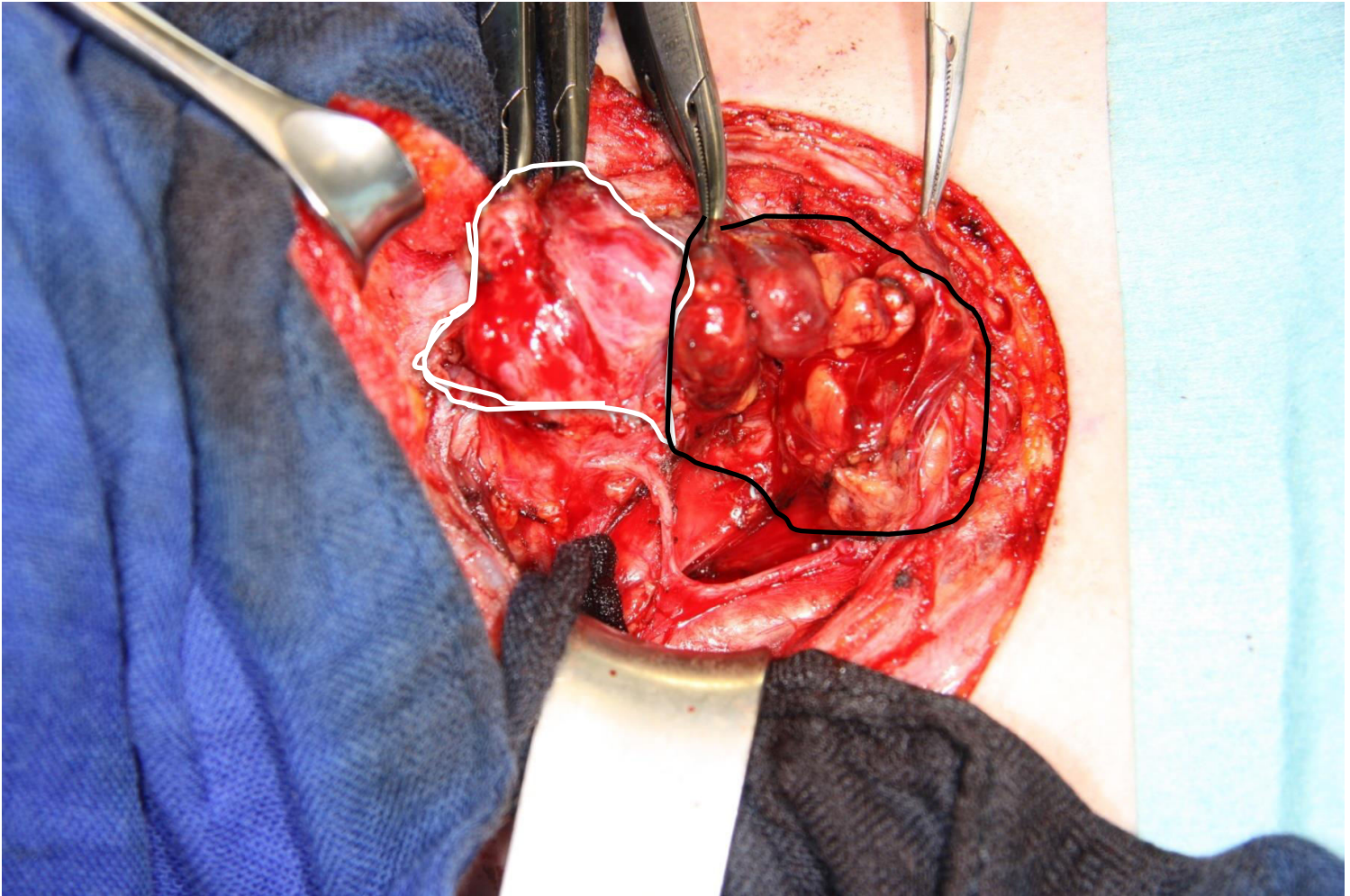






Zentrale Lymphknotendissektion







Symptomatik postop. Hypopara

erhöhte neuromuskuläre Erregbarkeit

Kribbelparästhesien

Tetanie (Karpopedalspasmen)

Chvostek/Troussau



Langzeitfolgen

Reizbarkeit

Depressive Verstimmung

Unsicherheit im Sozialkontakt

Epilepsieähnliche Anfälle



Langzeitfolgen

Reizbarkeit

Depressive Verstimmung

Unsicherheit im Sozialkontakt

Epilepsieähnliche Anfälle

Intrakranielle Verkalkungen (Basalganglien)

Fahr Syndrom: Tremor- Rigor- Akinesie

Kardiomyopathie

Katarakt (Cataracta tetanica), Inzidenz: 50%



Langzeitfolgen

Reizbarkeit

Depressive Verstimmung

Unsicherheit im Sozialkontakt

Epilepsieähnliche Anfälle

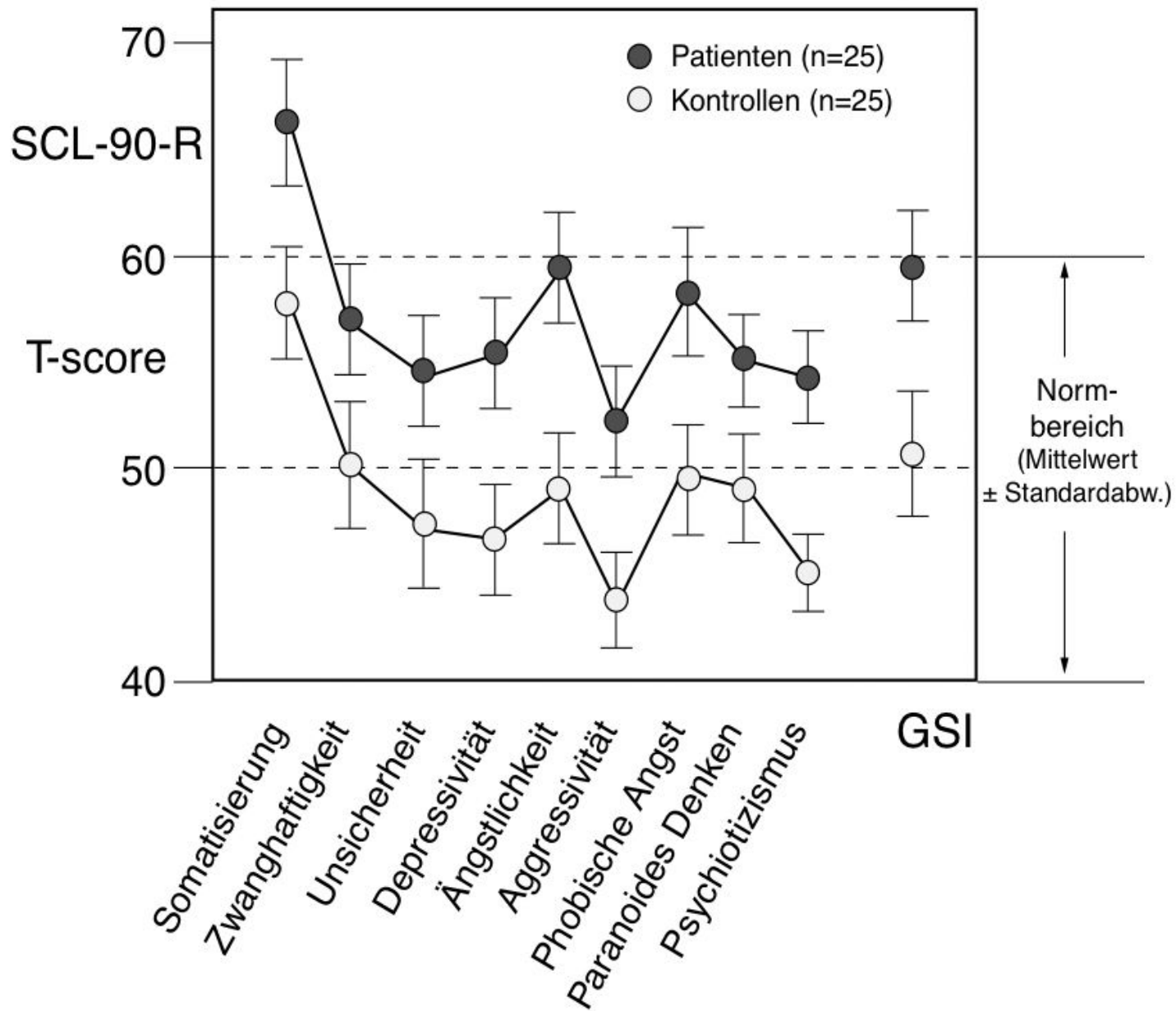
Intrakranielle Verkalkungen (Basalganglien)

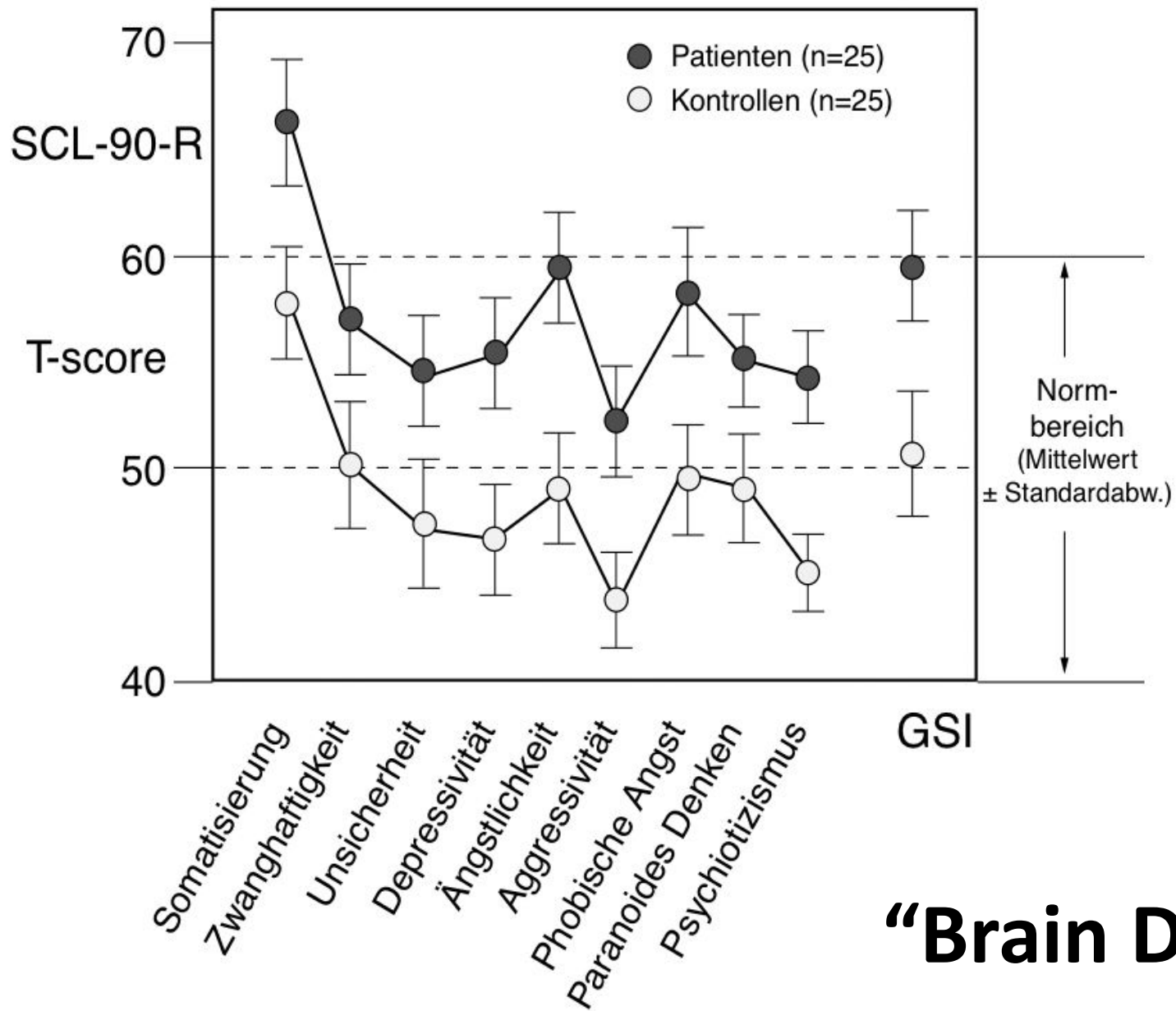
Fahr Syndrom: Tremor- Rigor- Akinesie

Kardiomyopathie

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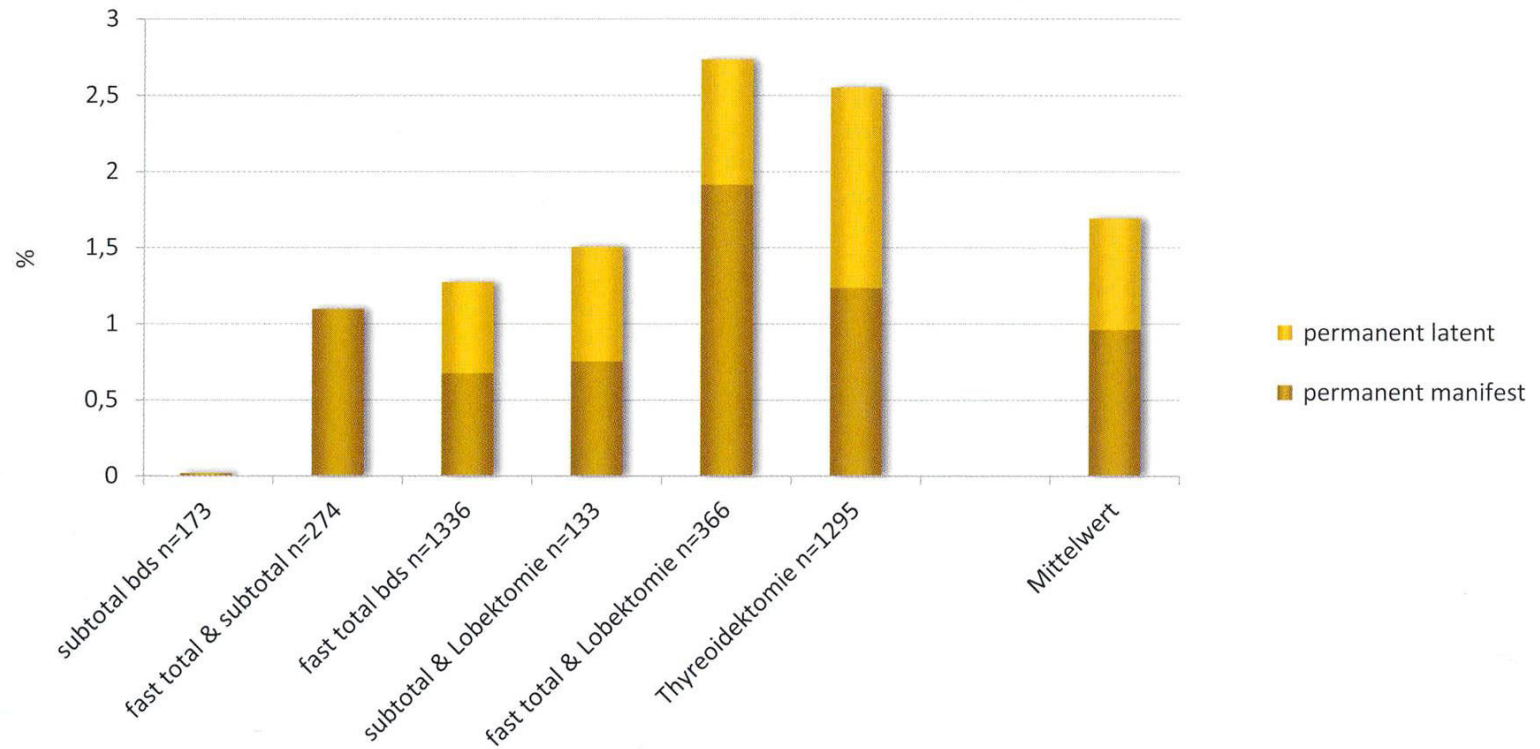
Lebensqualität hochgradig eingeschränkt!



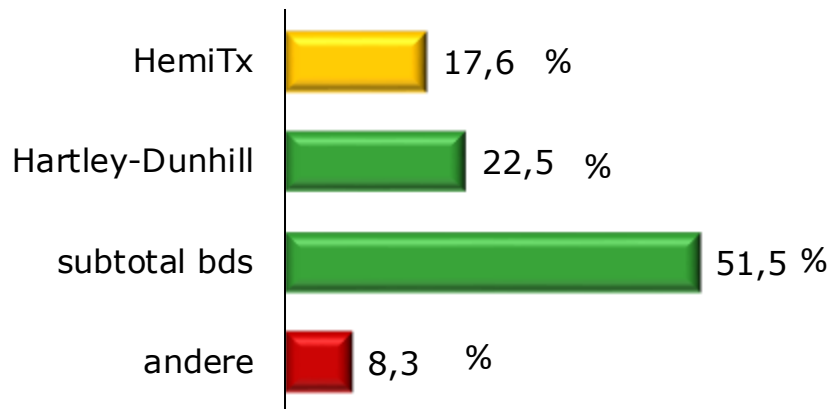


“Brain Dust”

Hypopara- Resektionsausmaß



Zunahme der Risikooperationen

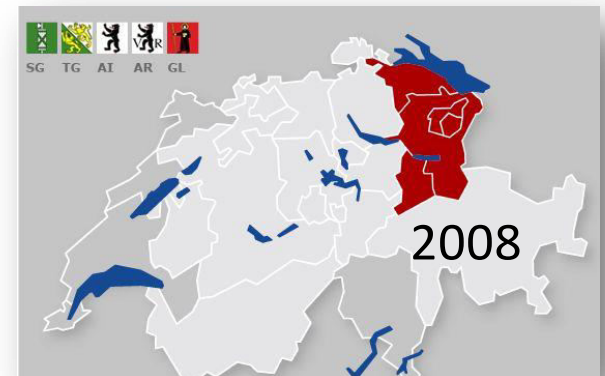
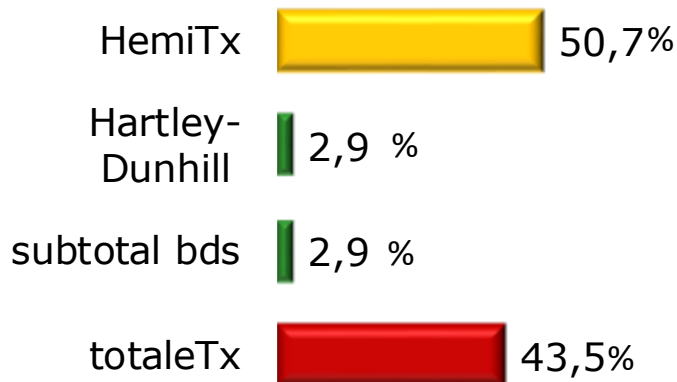


Risk factors of paralysis and functional outcome after recurrent laryngeal nerve monitoring in thyroid surgery

Henning Dralle, MD, Carsten Sekulla, PhD, Johannes Haerting, MD, Wolfgang Timmermann, MD, Hans Jürgen Neumann, MD, Eberhard Kruse, MD, Stefan Grond, MD, Hans Peter Mühlig, MD, Christian Richter, MD, Johannes Voß, MD, Oliver Thomusch, MD, Hans Lippert, MD, Ingo Gastinger, MD, Michael Brauckhoff, MD, and Oliver Gimm, MD, Halle, Wuerzburg, Goettingen, Munich, Dresden, Freiburg, Magdeburg, and Cottbus, Germany

(Surgery 2004;136:1310-22.)

1998 – 2001, n= 16'448



n= 311

Th. Clerici, St. Gallen



Vermeidungsstrategien

*“En se battant pour chaque
parathyroïde comme si c’était
la dernière”* Ch. Proye

Flushtest

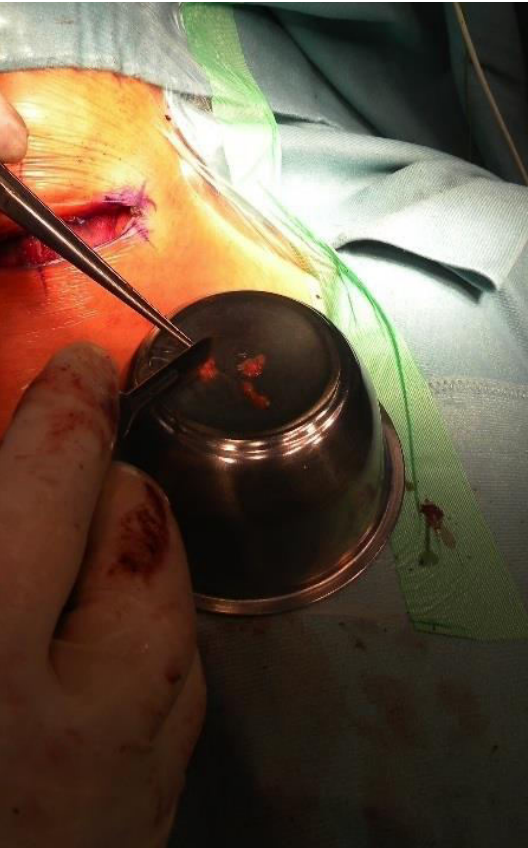
Autotransplantation



C. Proye, Lille

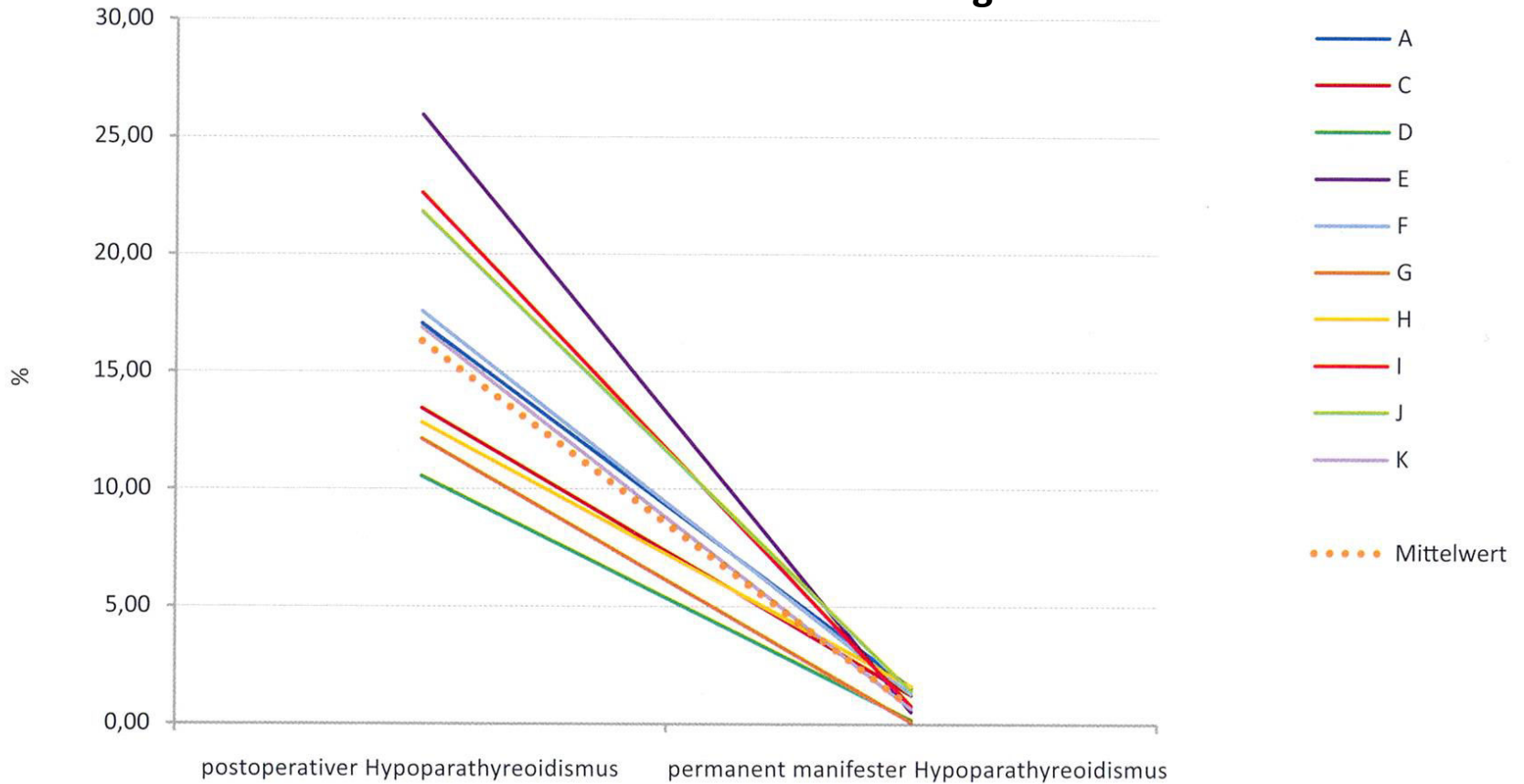
Zuerst Nebenschilddrüsenoperation, dann Schilddrüsenoperation

Autotransplantation





In 80-90% nach 2 Wochen rückgebildet!





Risikofaktor Chirurg

| Zentrum | n | %perm HypoP |
|----------------------------|---------|-------------|
| Delbridge L, 1999 | n= 1251 | 0.4% |
| Rosato L, 2004 | n= 9599 | 2.2% |
| Chirurgie KSSG (2001-2013) | n= 929 | 2.0% |
| O'Brian CJ, 2004 | n= 834 | 2.4% |
| Bellantone R, 2002 | n= 526 | 3.4% |
| A. Sitges-Serra, 2010 | n= 442 | 3.8% |

INSENSU

300 Mitglieder

Seit 2004: ca 60.300 Zugriffe auf die Homepage



Probleme der Patienten mit Hypopara:

HA haben in der Th des Hypopara wenig Erfahrung, sind nicht vertraut

Patienten sind nicht informiert

Trotz normaler Kalziumwerte treten Beschwerden auf

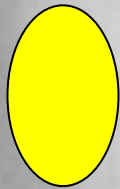
Sehr oft unzulängliche Therapie

prim. Hyperparathyreoidismus

Symptome

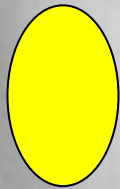
- Knochenschmerzen/Osteopenie/Frakturen
- Nierensteine/Nephrocalcinose
- Gestörte neuromuskuläre Funktion
(Müdigkeit/Depression)
- Gefäßverkalkungen
- Magen/Duodenalulcus

Primärer Hyperparathyreoidismus



Primärer Hyperparathyreoidismus

95% Eindrüsenerkrankung





Hungry Bone Syndrom nach Parathyroidektomie

Restl. 3 NSD supprimiert

Remineralisation des Knochens bei niedrigem PTH...Hypokalziämie

Nadir 3.-4. Tag

Ca Substitution (po. oder iv.) bis der Patient beschwerdefrei ist

Cave: nach ein paar Wochen steigt PTH wieder: Kollegen und Patienten sind beunruhigt!

Serum Kalzium ist im niedrigen Normalbereich

Kein Rezidivhyperpara sondern passagerer sekundärer Hyperpara nach erfolgreicher Operation eines pHPT (Ca niedrig normal/PTH erh.)

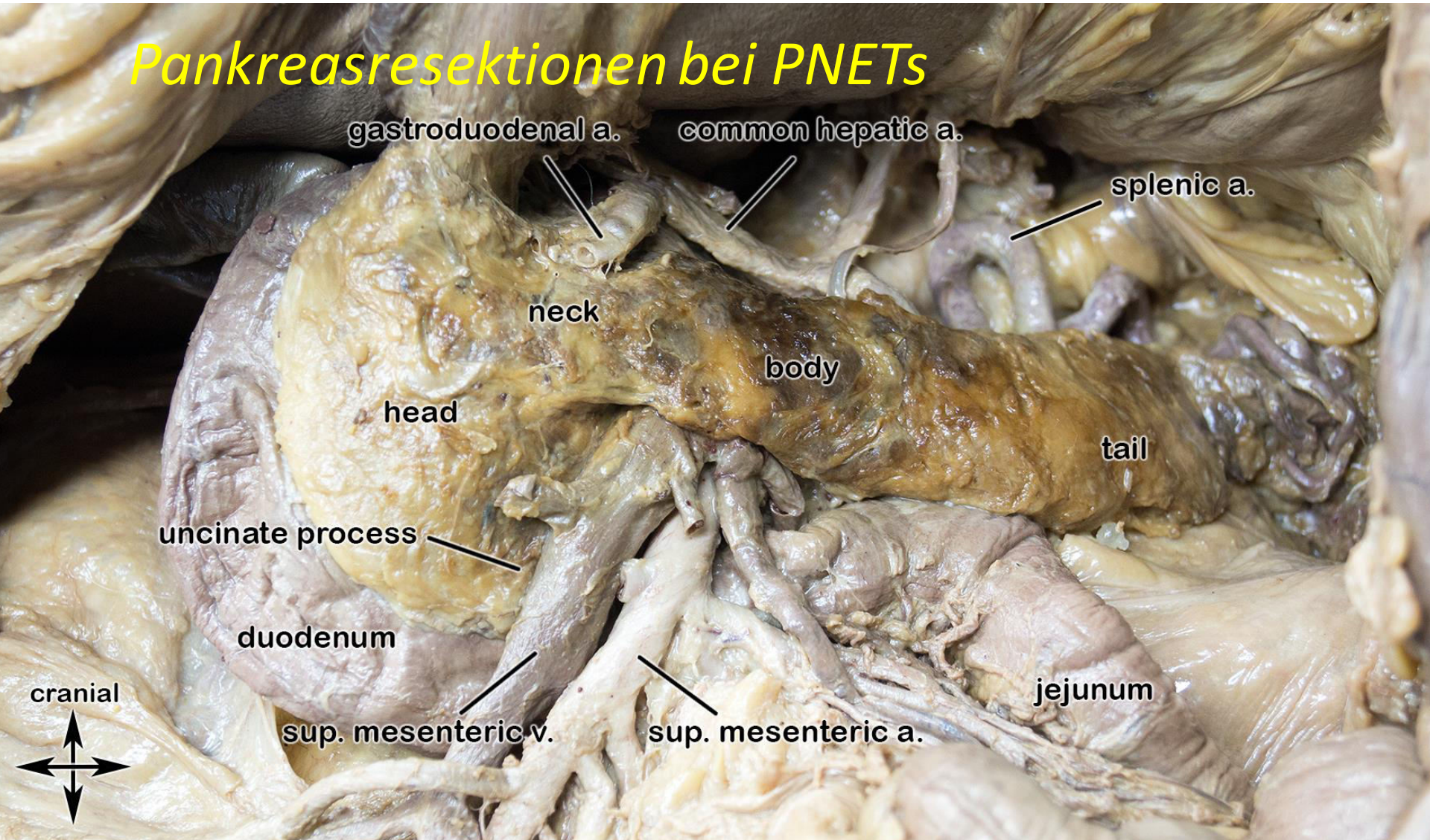
Adrenalektomie

Postop. Nebennierenfunktion

- Synactentest (1-24 ACTH)
 - Bei ausreichender Stimulation keine Substitution notwendig



Pankreasresektionen bei PNETs

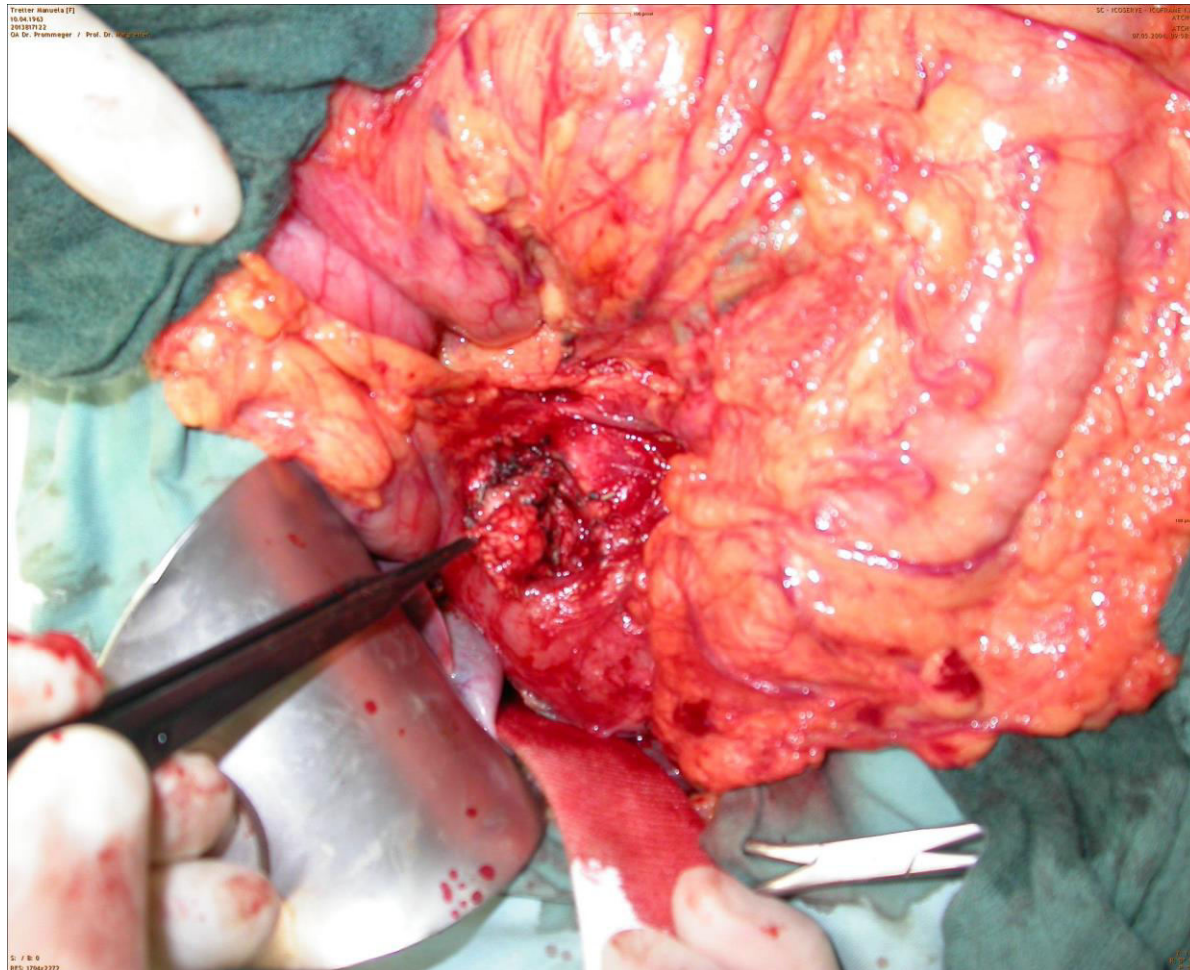




Insulinom

95% benigne
und <2cm

Enukleation





Milzerhaltende Pankreaslinksresektion-Insulinom

I.S.D.S-2016-Brac



Pankreasmangeldiabetes

Nesidioblastose

MEN I Syndrom (theoretische Option)

The surgical management of MEN-1 pancreaticoduodenal neuroendocrine disease

Mark S. Hausmann, **Norman W. Thompson**, Paul G. Gauger, Gerard M. Doherty
Ann Arbor Michigan
Surgery 2004; 136: 1205-11

MEN 1 (3xP): **P**arathyroid (100 %, mit 30a)
Pancreas (35-75%)
Pituitary (15-50%)

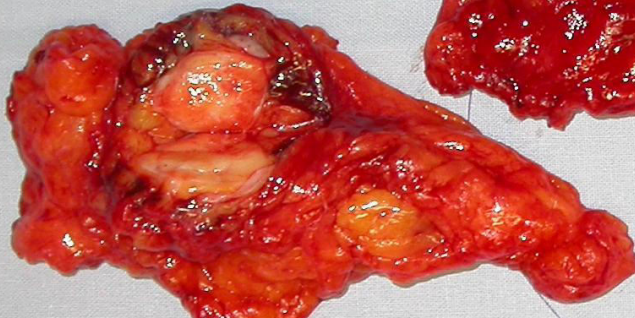
Autosomal dominant

Hohe Penetranz bei Genträgern
11q13
Genprodukt: Menin (610AS)

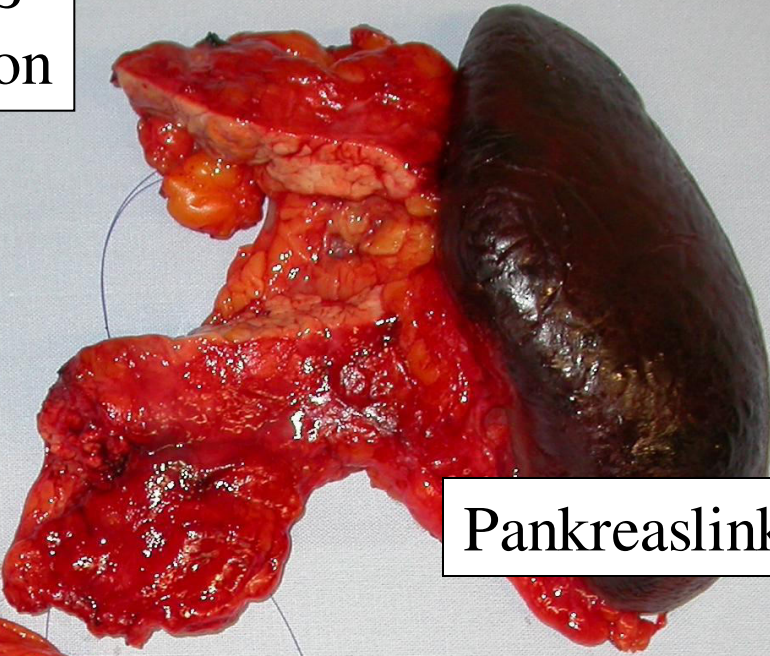
Idealer Zeitpunkt der OP??

Pankreas: im 4. Lebensjahrzehnt multiple endokrine Tumore (langsam progredient)
Funktionell inaktiv, hormonell aktiv (Gastrin>Insulin>Glucagon>VIP), ab 2cm
Tumordurchmesser Zunahme der Malignitätswahrscheinlichkeit!

MEN I-Syndrom mit ZES
Sog.: Thompson Operation



Netzmetastase



Pankreaslinksresektat

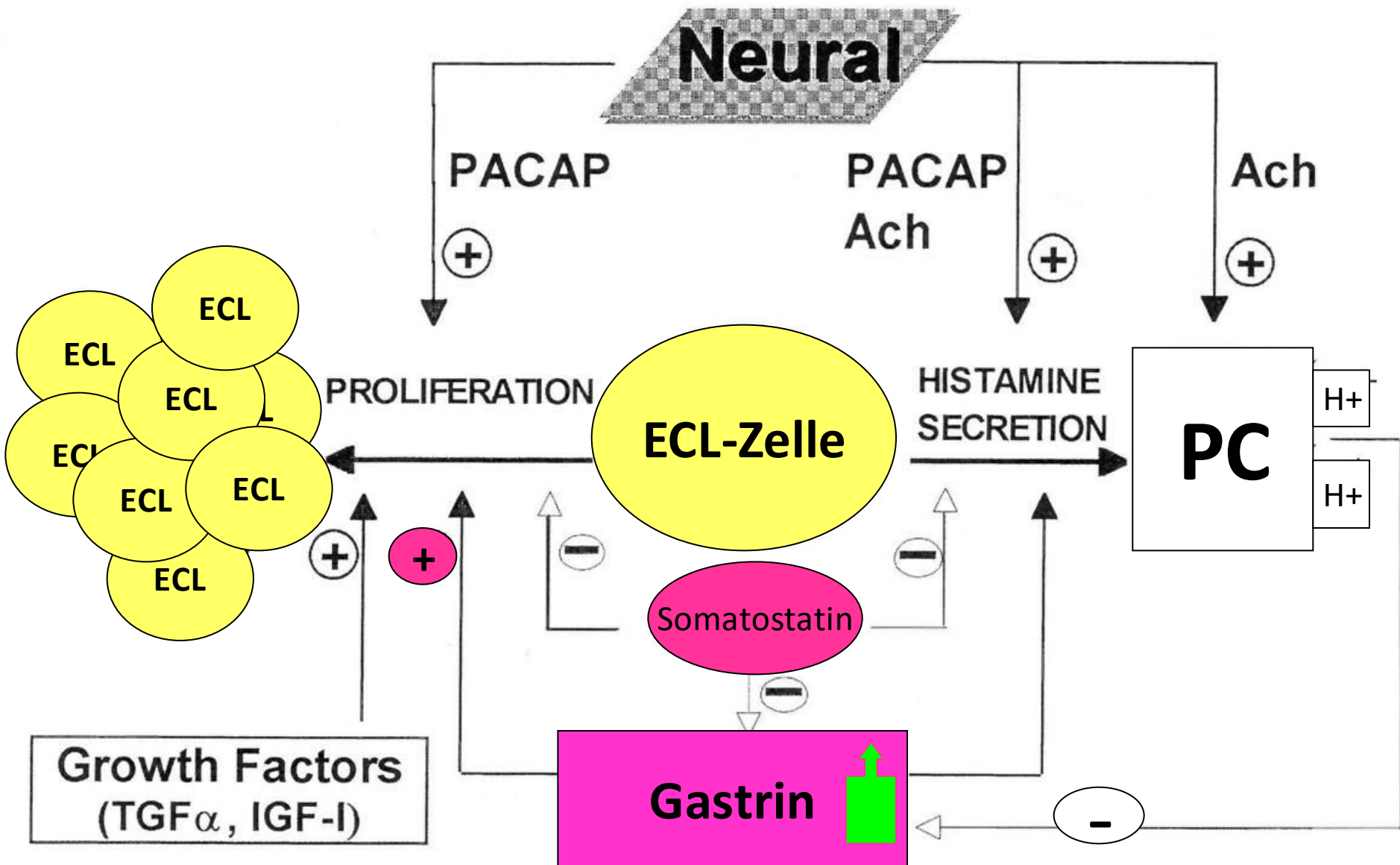


Typ II Magenkarzinoid

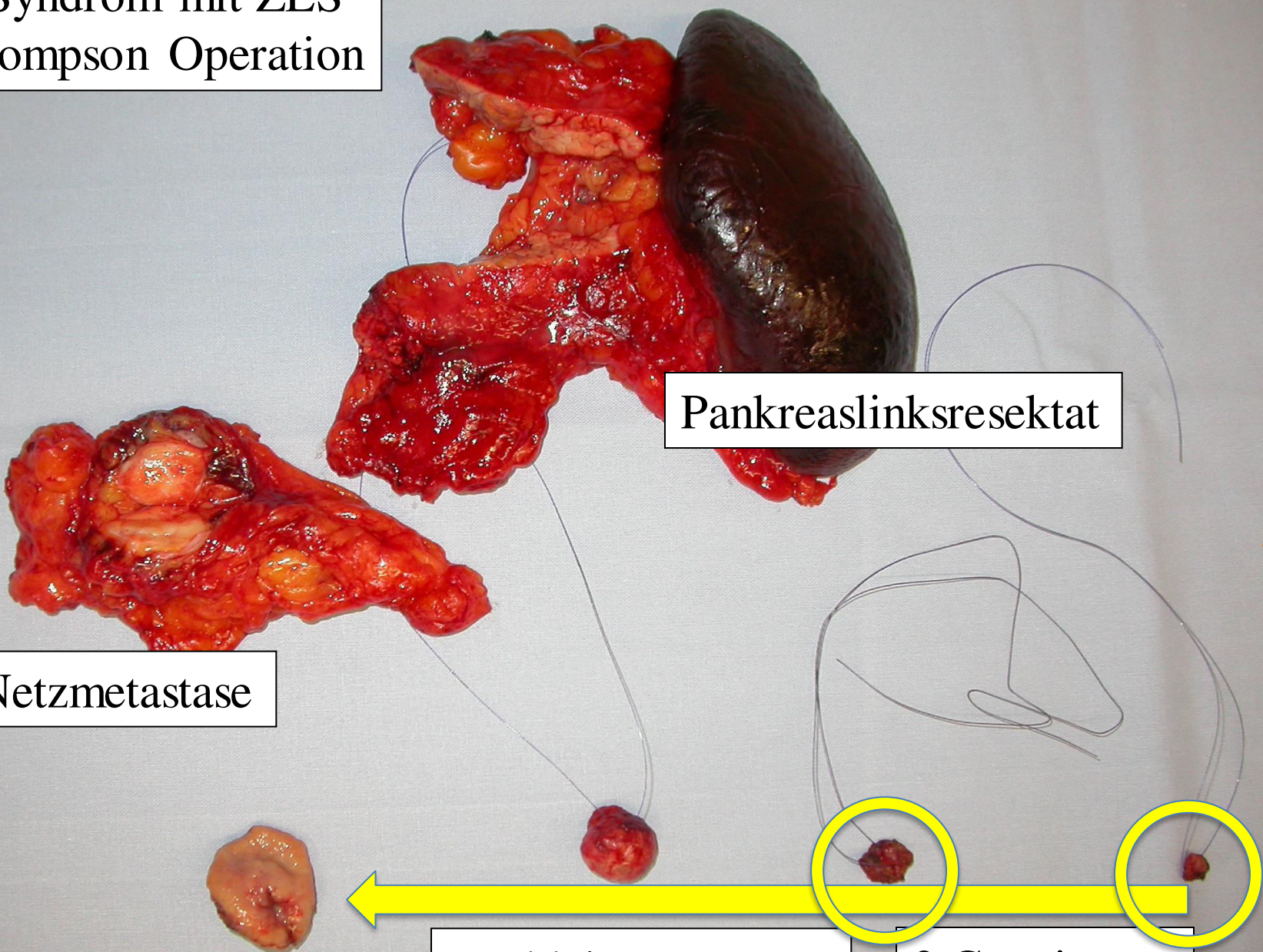
**Enukleierter Tumor
Pankreaskopf**

**2 Gastrinome
Duodenum**





MEN I-Syndrom mit ZES
Sog.: Thompson Operation



Pankreaslinksresektat

Netzmetastase

Typ II Magenkarzinoid

Enukleierter Tumor
Pankreaskopf

2 Gastrinome
Duodenum





Table 2. Various pancreatic resections with incidence of postoperative diabetes.

| Procedure (% resection) | Preop DM → postop DM | | Rx of postop DM | Mortality (%) | Other postop findings |
|---|---|-----------------|--|---------------------|---|
| Total (100%) pancreatectomy | 42% | 100% [8] | 75% Difficult to stabilize with insulin [8] | 20.6 [8] | Undetectable PP levels [9] Alpha cell function absent [10] Insulin sensitivity [6] |
| Near-total (80%–95%) pancreatectomy | 40% | 100% [2] | 30% Diet or oral hypoglycemics [2] | 1.3 [11] | 26% Late mortality 2.5–4.0 years postop [11] |
| | 28% | 73% [11] | 80% Require insulin [11] | | |
| Pancreaticoduodenectomy (50%) | 82% = deterioration of OGT [12] May have preop hypoglycemia if resection is for insulinoma | | hypoglycemics 59% Require insulin [11] | | postop [11] No PP deficiency [18] |
| | 15% | 26% [11] | 60% Diet or oral hypoglycemics 40% Require insulin [11] | 0.6 [14] 8.2 [8] | PP deficient with hepatic insulin resistance |
| Pylorus-preserving pancreaticoduodenectomy (50%) | 27% IDDM | 37% IDDM | | 0 [4, 15] | Insulin secretion capacity, glucagon secretion capacity [4] PP deficient with hepatic insulin resistance |
| | 40% IOGTT | 40% IOGTT | | | |
| Duodenum-preserving pancreatic head resection/Beger procedure (30%) | 33% Normal | 23% Normal [15] | | 0 [4] | Insulin secretion capacity, glucagon secretion capacity [4] postop morbidity 20% [17] |
| | All glucose-intolerant postop [4] | | | | |
| Duodenum-preserving pancreatic head resection/Frey procedure (15%) | 45% IDDM | 45% IDDM [16] | | 0–3.2 [15, 17] | Postop morbidity 9% [17] |
| | 40% IOGTT | 45% IOGTT [16] | | | |
| | 15% Normal | 10% Normal [17] | | | |
| | All Normal glucose tolerance postop [4] | | | | |
| | 5.4% Incidence new-onset IDDM [18] | | | | |
| | 36% IDDM | 36% IDDM | | | |
| | 46% IOGTT | 50% IOGTT | | | |
| | 18% Normal | 14% Normal [17] | | | |

IOGTT: impaired oral glucose tolerance; OGT: oral glucose tolerance; DM: diabetes mellitus; Rx: treatment.

Table 2. Various pancreatic resections with incidence of postoperative diabetes.

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| | All glucose-intolerant postop [4] 45% IDDM 40% IOGTT 15% Normal | 45% IDDM [16] 45% IOGTT [16] 10% Normal [17] | | 0 [4] | Insulin secretion capacity, glucagon secretion capacity [4] postop morbidity 20% [17] |
| Duodenum-preserving pancreatic head resection/Beger procedure (30%) | All Normal glucose tolerance postop [4] 5.4% Incidence new-onset IDDM [18] | | | | |
| | 36% IDDM 46% IOGTT 18% Normal | 36% IDDM 50% IOGTT 14% Normal [17] | | 0–3.2 [15, 17] | Postop morbidity 9% [17] |

IOGTT: impaired oral glucose tolerance; OGT: oral glucose tolerance; DM: diabetes mellitus; Rx: treatment.



Table 1. Types of diabetes mellitus.

| Parameter | Type I IDDM juvenile onset | Type II NIDDM adult onset | Type III pancreatogenic postoperative onset |
|-----------------------------------|-------------------------------|---------------------------------|--|
| Ketoacidosis | Common | Rare | Rare |
| Hyperglycemia | Severe | Usually mild | Mild |
| Hypoglycemia | Common | Rare | Common |
| Peripheral insulin sensitivity | Normal or increased | Decreased | Increased |
| Hepatic insulin sensitivity | Normal | Normal or decreased | Decreased |
| Insulin levels | Low | High | Low |
| Glucagon levels | Normal or high | Normal or high | Low |
| PP levels | High | High | Low |
| Typical age of onset | Childhood or adolescence | Adulthood | Any |

IDDM: insulin-dependent diabetes mellitus; NIDDM: non-insulin-dependent diabetes mellitus; PP: pancreatic polypeptide.



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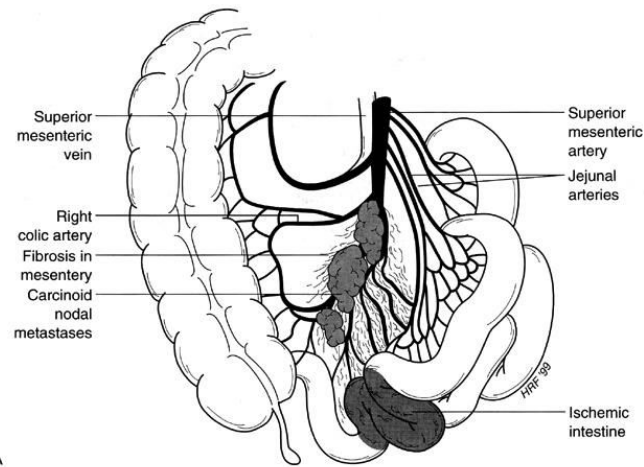
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NET Dünndarm-Kurzdarmsyndrom

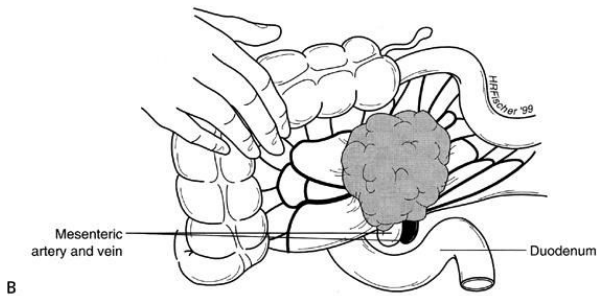
kleines Primum, 30% multifokal

in 80-90% mesenteriale LK-Meta

„Pat. imponiert inoperabel“



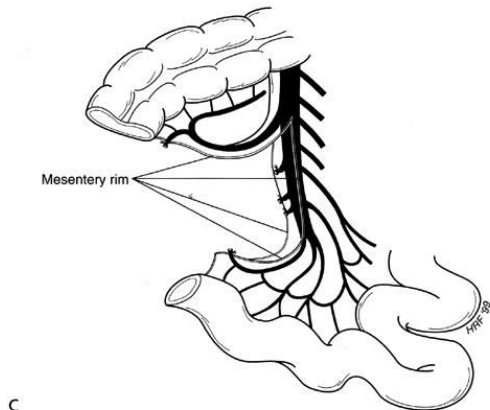
A



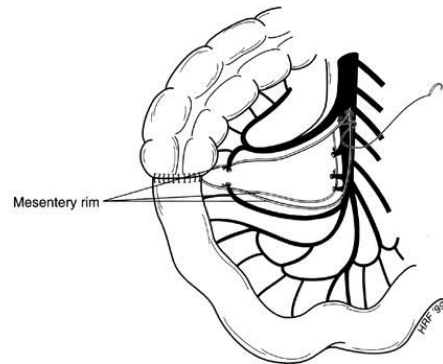
B

Desmoide Reaktion
Tumor-cake

Ischämien



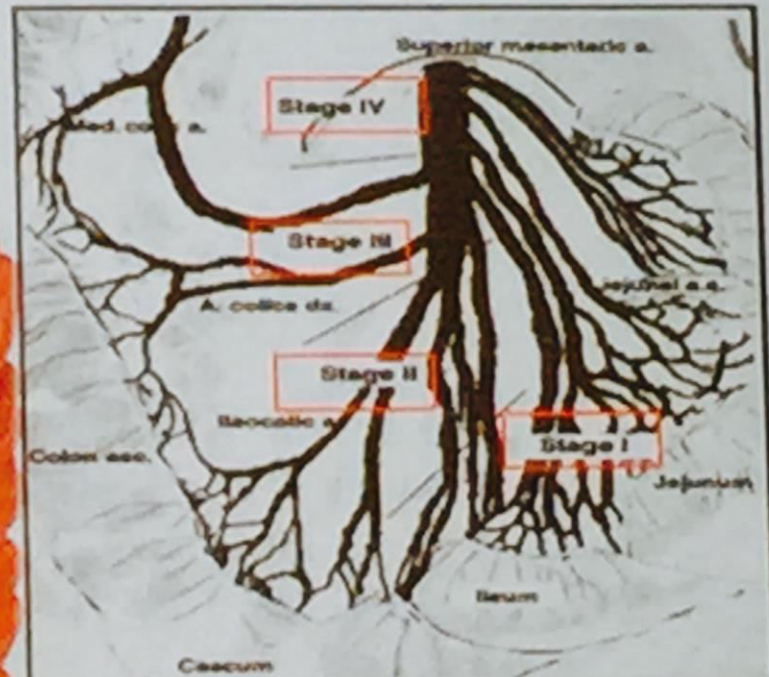
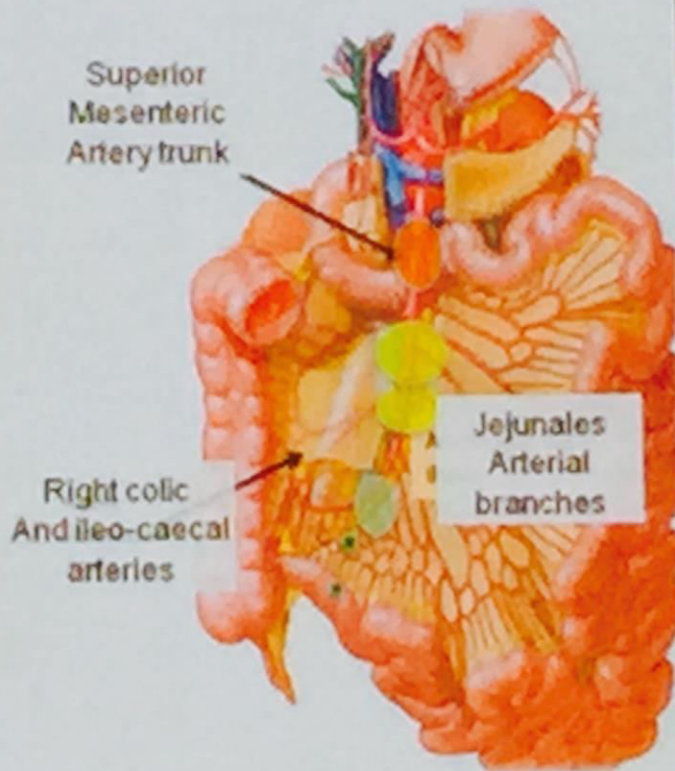
C



D

Need for preoperative classification

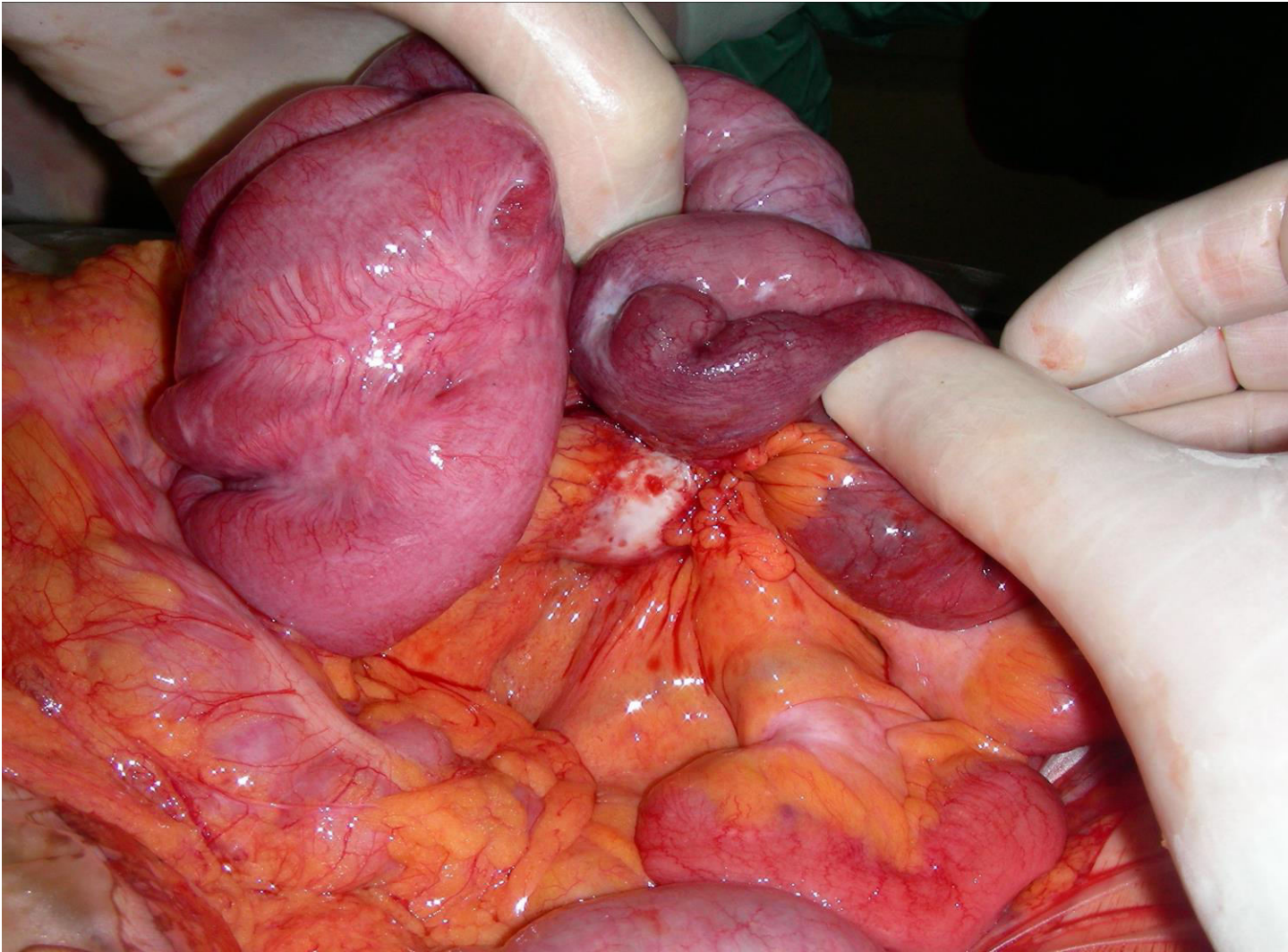
- Inspired from intraoperative schema of Ohrvall et al. 2000 (Upsala)



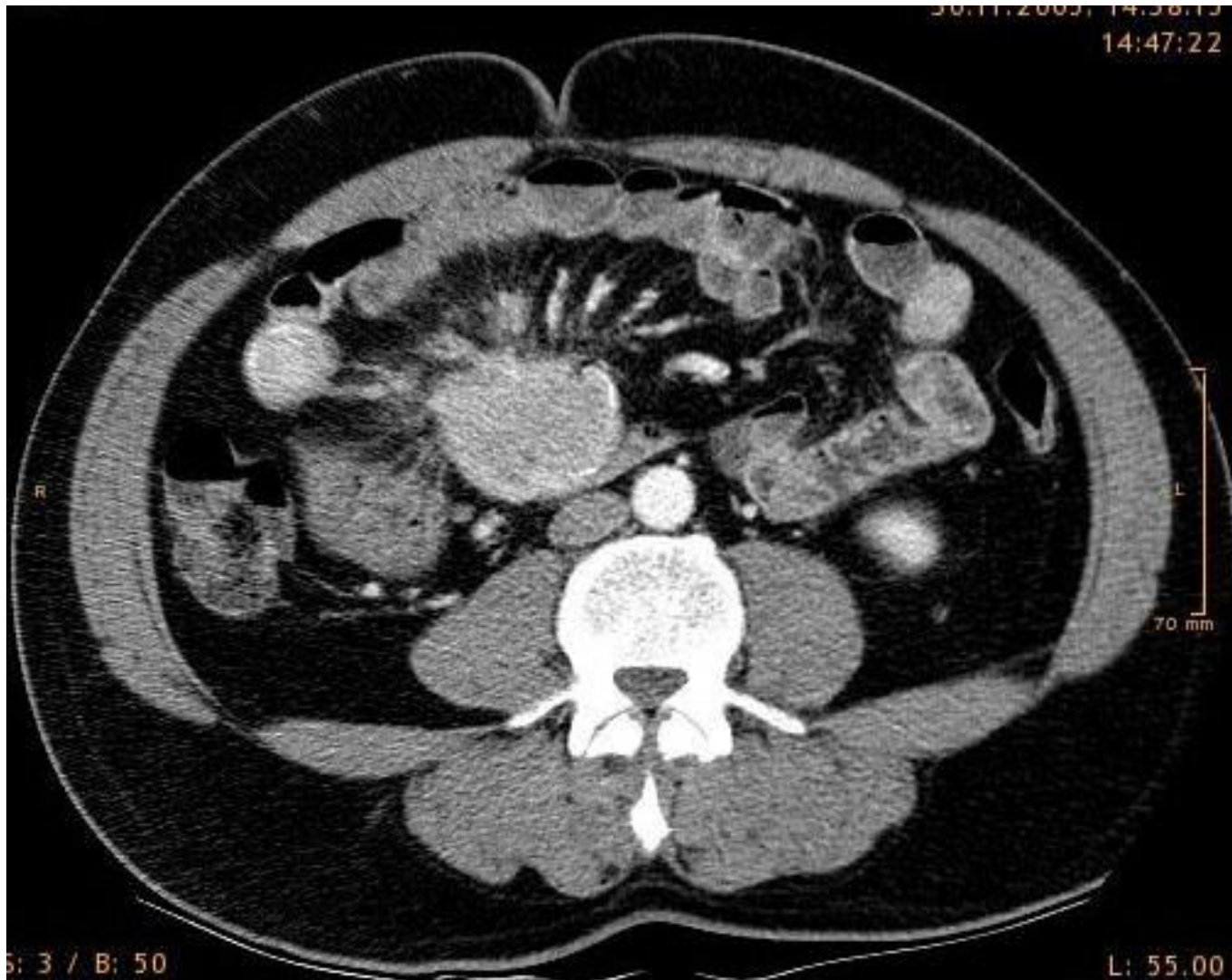
Method for Dissection of Mesenteric Metastases in Mid-gut Cancer

Ulf Ohrvall, M.D., Ph.D.,¹ Danfve Eriksson, M.D., Ph.D.,² Claes Juhlin, M.D., Ph.D.,² Susanna Kazaragi, M.D., Ph.D.,¹ Jonas Rastal, M.D., Ph.D.,¹ Per Hellman, M.D., Ph.D.,¹ Göran Akervall, M.D., Ph.D.¹

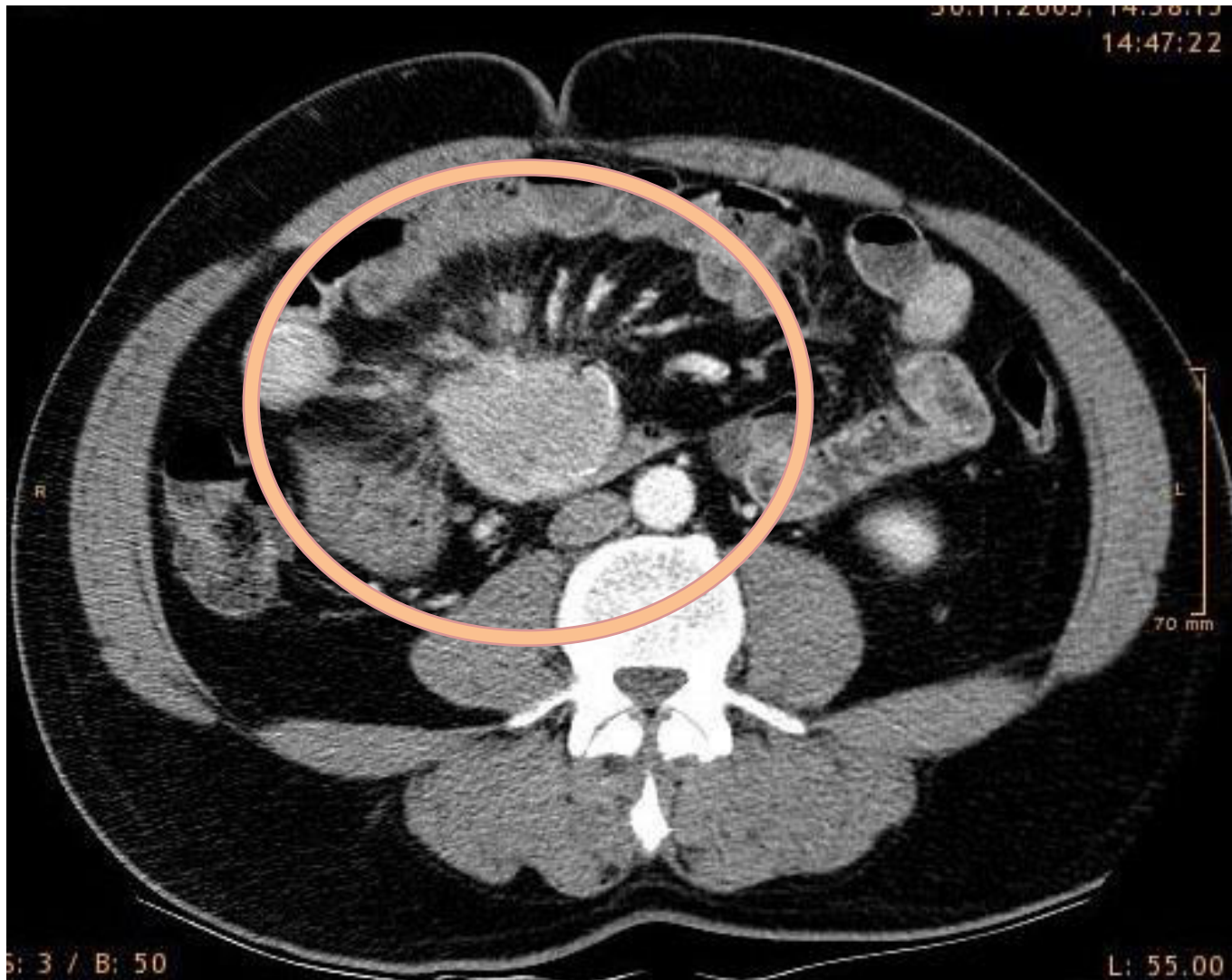
¹Department of Surgery, University Hospital, S-701 85 Uppsala, Sweden
²Department of Medicine, University Hospital, S-751 85 Uppsala, Sweden



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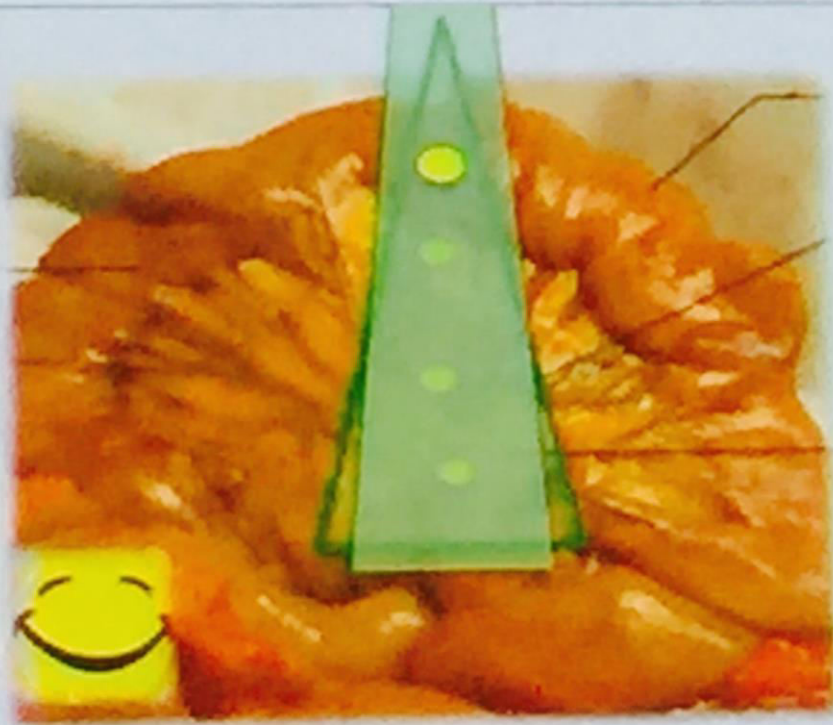


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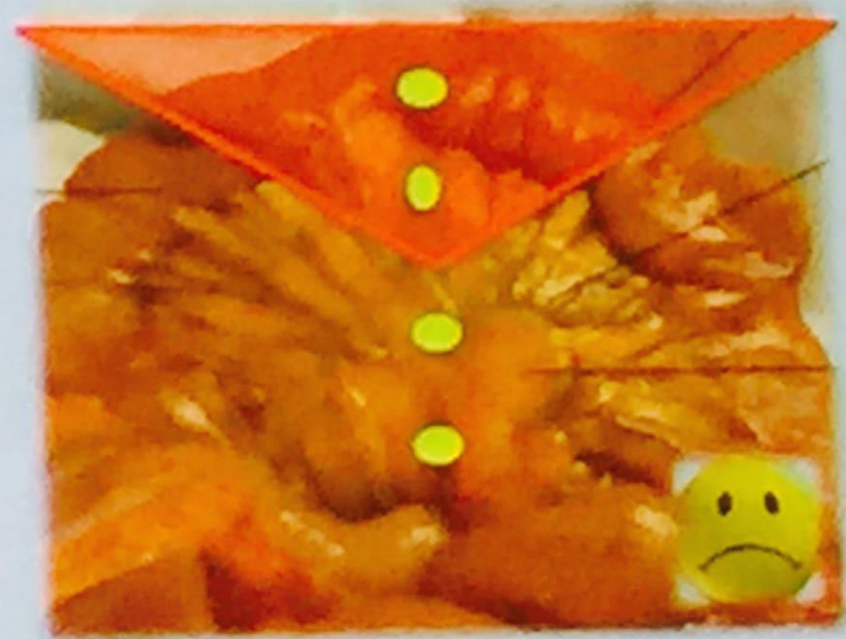




Abandon Pizza Pie rule...



moderne



NO

