Complications of Endocrine / Breast Surgery

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Breast and Endocrine Surgery : Complications

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New Plymouth

28 March 2020

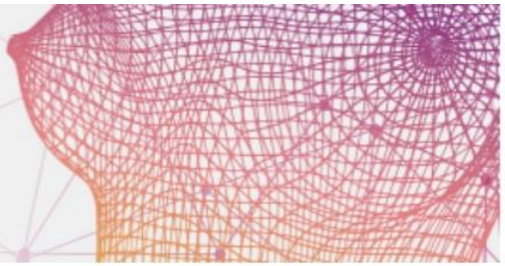
26 March 2021

A personal story

- Prepared this talk Jan 20 holidays (Ye)
- BUT Covid happened and computer self destructed and talk not backed up
- ***** Expletives
- Covid 2020 - Life changed for the world
- New words like lockdown, pandemic, social distancing, bubbles
- Communication: Zoom, Teams, Webinars (1am)
- Back on call as the “Junior Register” receiving 30-40 calls re admissions or problems - makes you appreciate the on call junior reg - 4 calls at once too much to cope with!

BREAST SURGEON WEBINAR

Preoperative considerations in early breast cancer: What's changing?



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When?

What time?

Breast and Endocrine Surgery : Complications

- **Short term complications** e.g. haematoma, seroma, pain, hypocalcaemia
- **Long term complications/consequences** (disease and surgical)

  Chronic pain, lymphoedema, poor cosmesis, hypoparathyroidism, voice change, anxiety and depression, recurrence of cancer
- **Patient's concern**

  Need for long term medication, anxiety for risk of recurrence of cancer, any complications
- **Doctor patient relationship** and complications

Breast and Endocrine Surgery : Complications

1. Haematoma after thyroid/parathyroid surgery
2. Open v laparoscopic adrenalectomy? - adrenal surgery
3. Injury to the parathyroid(s) during a thyroidectomy
4. Anaphylaxis and sentinel node biopsy

Post-op Haematoma: Thyroid/Parathyroid Surgery

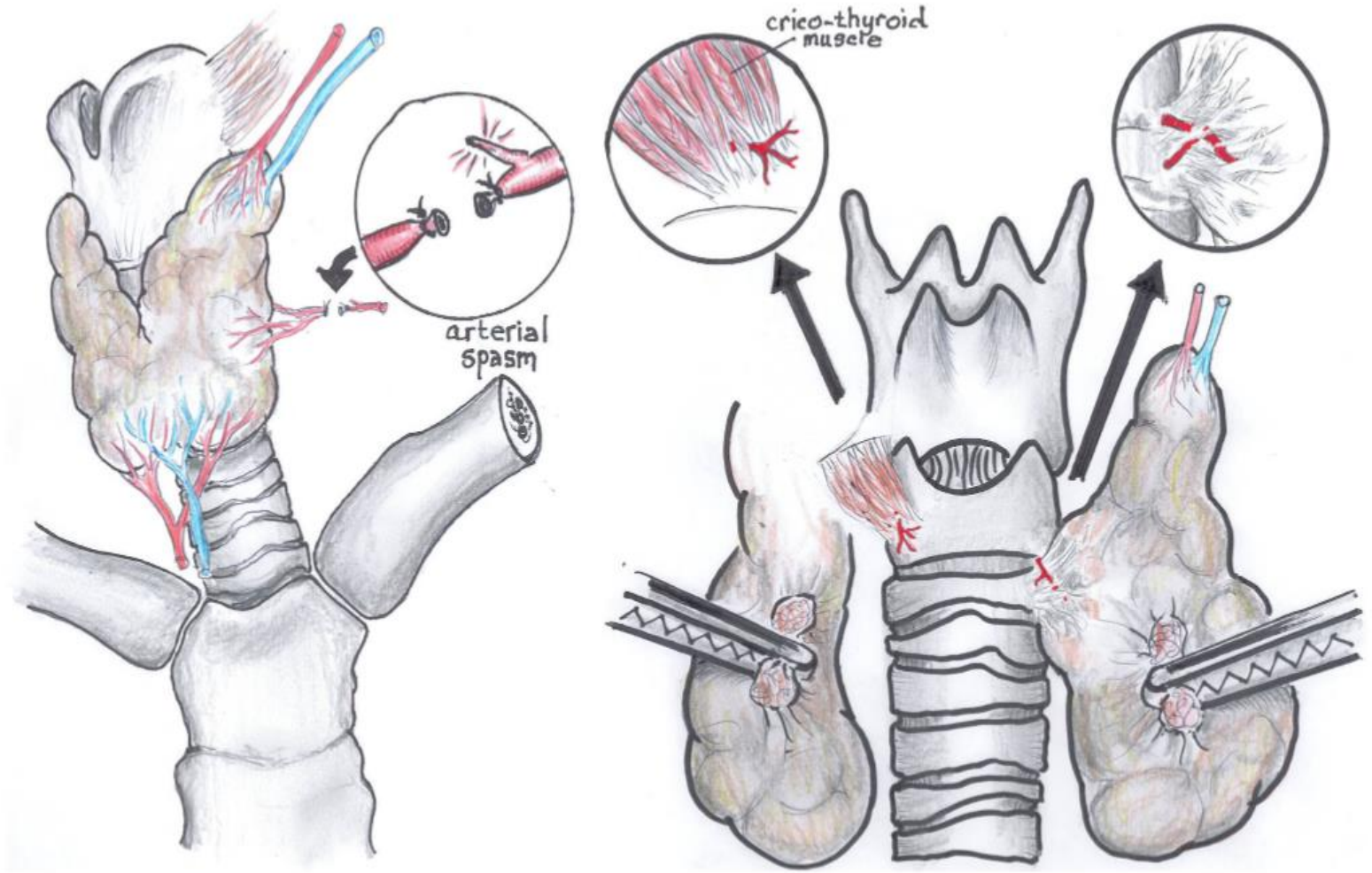

Fig. 2 Frequent sites of missed bleeding

Thyroid/Parathyroid Wound Haematoma: a few personal stories

- Moving patient off the theatre bed, suddenly 300ml in the drain. Wound not swollen. Transfer back to theatre bed. Re-open. Arterial bleeder. Very late list but patient ok
- Completed Thyroid Op. Started next case. Recovery phone. Rapid neck swelling. Lucky spare theatre. 2nd anaesthetist looked after my breast case. Opened 1st case under LA, anaesthetist in attendance. Bleeder controlled and closed. Assistant was a gynaecologist who was happy to help in an emergency
- 9pm phone call from private hospital. Thyroid patient SOB but no neck swelling. Nurses asking could it be asthma! 15 min drive, Red lights++. Neck wound opened by a colleague and anaesthetist on ward. Lifesaving. Transferred to OT. Very stressed patient post operatively.

History of Thyroid Surgery

- Abu al-Quasim – 952 AD-first goiter excision – “just avoided exsanguination”
- Diffenbach – 1848 “one of the most thankless, most perilous undertakings, if not prohibited should be restricted
- Theodor Billroth - 1860 8/20 first goitre patients died peroperatively. By 1866 with improvements in anaesthesia, asepsis and haemostasis death rate fell to < 10%.
- Emil Kocher - 1909 Nobel prize as reduced mortality to <1%. By 1912 after 5000 cases his mortality rate was < 0.5%

Thyroidectomy Parathyroid Post Operative Haematoma

- Presentation – wound swelling, excessive drain volume, pain, dyspnoea, stridor, hypoxia
- Definition – haemorrhage into wound (superficial or deep compartments)
- Differential Dx - seroma, swelling, bilateral RLN palsy
- Incidence – rare, aim for <1%
- Timing
- Risk Factors
- Management
- Cost

Langenbeck's Archives of Surgery (2019) 404:815–823
https://doi.org/10.1007/s00423-019-01836-4

ORIGINAL ARTICLE

Evaluating risk factors for re-exploration due to postoperative neck hematoma after thyroid surgery: a nested case-control study

Farhad Allahyar Salem[1] · A. Bergenfelz[1] · E. Nordenström[1] · J. Dahlberg[2] · O. Hessman[3] · C. I. Lundgren[4] · M. Almquist[1]

Table 5 Time pattern for 152 patients with reoperation for postoperative bleeding

0–6 h	6–12 h	12–24 h	>24 h
97 patients	24 patients	16 patients	15 patients
64%	16%	10%	10%

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- National Swedish Population Register, matched for age and gender
- 9494 operations
- 174 (1.8%) post-op haematoma
- 64% within 6 hours
- Univariable and multivariable analysis of many potential risk factors

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- National Swedish Population Register, matched for age and gender
- 174 (1.8%) post-op haematoma
- Risks analysis
  - Older 58 v 49 (p0.01)
  - Male > female (p0.01)
  - Drains (survey data)
- Conclusion: even with careful selection prolonged observation may be necessary

A Multi-institutional international study of risk factors for hematoma after thyroidectomy

Surgery Volume 154, Number 6, Campbell et al, 1285

http://dx.doi.org/10.1016/j.surg.2013.06.032

- 217 post op haematomas, 15 institutions
- Timing – median to return to theatre was 7 hours (0 mins- 9 days)
- 47% < 6 hours
- 79% < 24 hours
- Source of bleeding
  - Not identified 13%
  - “Unnamed” vessel 34%
  - Superior pole vessel 25%
  - Inferior pole vessel 10%

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Multivariate analysis, independent associations with haematoma

- Drain (odds ratio, 2.79)
- Graves' disease (odds ratio, 2.43)
- Benign pathology (odds ratio, 2.22)
- Antiplatelet/anticoagulation medications (odds ratio, 2.12)
- Hemostatic agent (odds ratio, 1.97)
- Increased thyroid mass (odds ratio, 1.01)

Drains and haemostatic agents may represent surgeons concern

Table 3. Simple analysis of risk factors for postoperative bleed/re-exploration of the wound (BMI, body mass index; SBP, systolic blood pressure)

Factor	*P*-value
Gender	0.99*
Age	0.18†
Ethnic group	0.096*
ASA status	0.90*
BMI	0.033†
Current smoker	0.48*
Hospital site	0.025*
Surgical team	0.034*
Operation type	0.34*
Operative time	0.62†
Wound drain	0.36*
Thyroid weight (log scale)	0.074†
Highest postoperative SBP	0.004†

†Z-test.

*Deviance test.

Morton RP, Clin. Otolaryngol.2015,40, 462–467

Post-op Haematoma Thyroid/Parathyroid Surgery - Management

- Awareness of risk – patient, nurses, junior doctors, colleagues
- Awareness of signs and symptoms
- Emergency wound opening kit at bed side or on ward
- Haematoma may be superficial compartment, deep or both
- If early/stable transfer to OT

Thyroidectomy/Parathyroidectomy Haematoma - Management

- **Emergency – Beware "can't intubate or oxygenate" = surgical airway - Open the Wound**

- Remember 3 layers of sutures: skin-platysma-midline.
- Kit should always be available: Ward, Recovery -scissors, forceps, swabs.
- Decompress wound, allows airway control.
- Apply pressure and transfer to OT
- Let theatre and anaesthetist know early as possible

Operating Theatre

- Now time for to explore wound under LA/Sedation or GA.
- Irrigate, pack, gently explore. Beware suction -- RLN's and parathyroids
- Beware diathermy near RLN's and parathyroids
- If bleeding near RLN – **Care ++,** pack and apply pressure, clip or tie with nerve under vision
- Fibrilla or similar products useful

- **Non- emergency – return to OT, explore under GA**
- **Non acute haematoma best to drain as risk of infected haematoma**

Thyroid Haematoma – Time of Presentation and Anaesthesia

Table 3 Timing of presentation

Total		Surgery type		Anesthesia for exploration			
		Inpatient	Outpatient	Bedside ($n = 2$)	Local ($n = 6$)	Converted to general ($n = 5$)	General anesthesia ($n = 5$)
Immediate	5 (28 %)	4	1	2	1	0	2
<6 h	2 (11 %)	1	1	0	2	0	0
6–23 h	7 (39 %)	3	4	0	1	4	2
24–96 h	4 (22 %)	1	3	0	2	1	1

World J Surg (2014) 38:1262–1267

Post-op Haematoma : Thyroid/Parathyroid Surgery - Cost

Table 3. Comparison of patient clinical and economic outcomes by neck hematoma status, Nationwide Inpatient Sample 2000-2009, N = 147,344			
Variable	**Yes (n = 2210) Number (%)**	**No (n = 145,134) Number (%)**	**p value[a]**
Hospital charges above 75th percentile	1326 (60)	34,419 (23.7)	< 0.001
Length of stay above 75th percentile	1246 (56.4)	26,095 (18.0)	< 0.001
Death during hospitalization	53 (2.4)	498 (0.3)	< 0.001

[a] Derived from a χ^2 test.

- Perm J 2015 Winter: 19(1):22-28
- http://dx.doi.org/10.7812/TPP/14-085

JAMA Surg. 2019 Nov; 154(11): e193146.
Published online 2019 Sep 18. doi: 10.1001/jamasurg.2019.3146

PMCID: PMC6751786
PMID: 31532475

Association of Vessel-Sealant Devices vs Conventional Hemostasis With Postoperative Neck Hematoma After Thyroid Operations

Jennifer M. Siu, MD, MPH,[1,2] Justin C. McCarty, DO, MPH,[1,3] Shekhar Gadkaree, MD,[4,5] Edward J. Caterson, MD, PhD,[3] Gregory Randolph, MD,[4,5] Ian J. Witterick, MD, MSc, FRCSC,[2] Antoine Eskander, MD, ScM, FRCSC,[6,7] and Regan W. Bergmark, MD[1,5,8]

Method

- Cohort study
- 6522 propensity score-matched patients for thyroid surgery
- Vessel-sealant device v conventional haemostasis

Results

- Conventional increased odds of post op haematoma and increased length of stay
- No diff in RLN injury

Table 2.

Outcomes Before and After Propensity Score Matching

Outcome	Full Unmatched Cohort (N = 10 903)			1:1 Propensity Score–Matched Cohort (n = 6522)		
	Finding[a]	OR or IRR[b] (95% CI)	2-Sided *P* Value	Finding[a]	OR or IRR[b] (95% CI)	2-Sided *P* Value
Hematoma						
VSD	90 (1.25)	1 [Reference]	<.001	34 (1.04)	1 [Reference]	<.001
CH	90 (2.42)	1.96 (1.46-2.62)		78 (2.39)	2.33 (1.55-3.49)	
RLN Injury						
VSD	433 (6.06)	1 [Reference]	.24	198 (6.11)	1 [Reference]	.32
CH	204 (5.50)	0.90 (0.76-1.07)		180 (5.53)	0.90 (0.73-1.11)	
Operating Time, min						
VSD	119.6 (67.9)	1 [Reference]	<.001	116.2 (70.0)	1 [Reference]	.24
CH	113.5 (68.4)	0.95 (0.93-0.97)		114.4 (66.9)	0.99 (0.96-1.01)	
Length of Stay, d						
VSD	0.96 (1.78)	1 [Reference]	<.001	0.96 (2.07)	1 [Reference]	<.001
CH	1.29 (2.12)	1.34 (1.28-1.40)		1.24 (1.90)	1.29 (1.23-1.36)	

JAMA Surg. 2019 Nov: 154 (11): e193146

Post-op Haematoma Thyroid/Parathyroid Surgery: Day Surgery

- Day Surgery increasingly performed around the world
- Reduces costs, patient convenience, low morbidity

BUT

- Parathyroid/thyroid surgery– need at least 6 hours of observation and rapid assessment/treatment after discharge as late haematomas occur

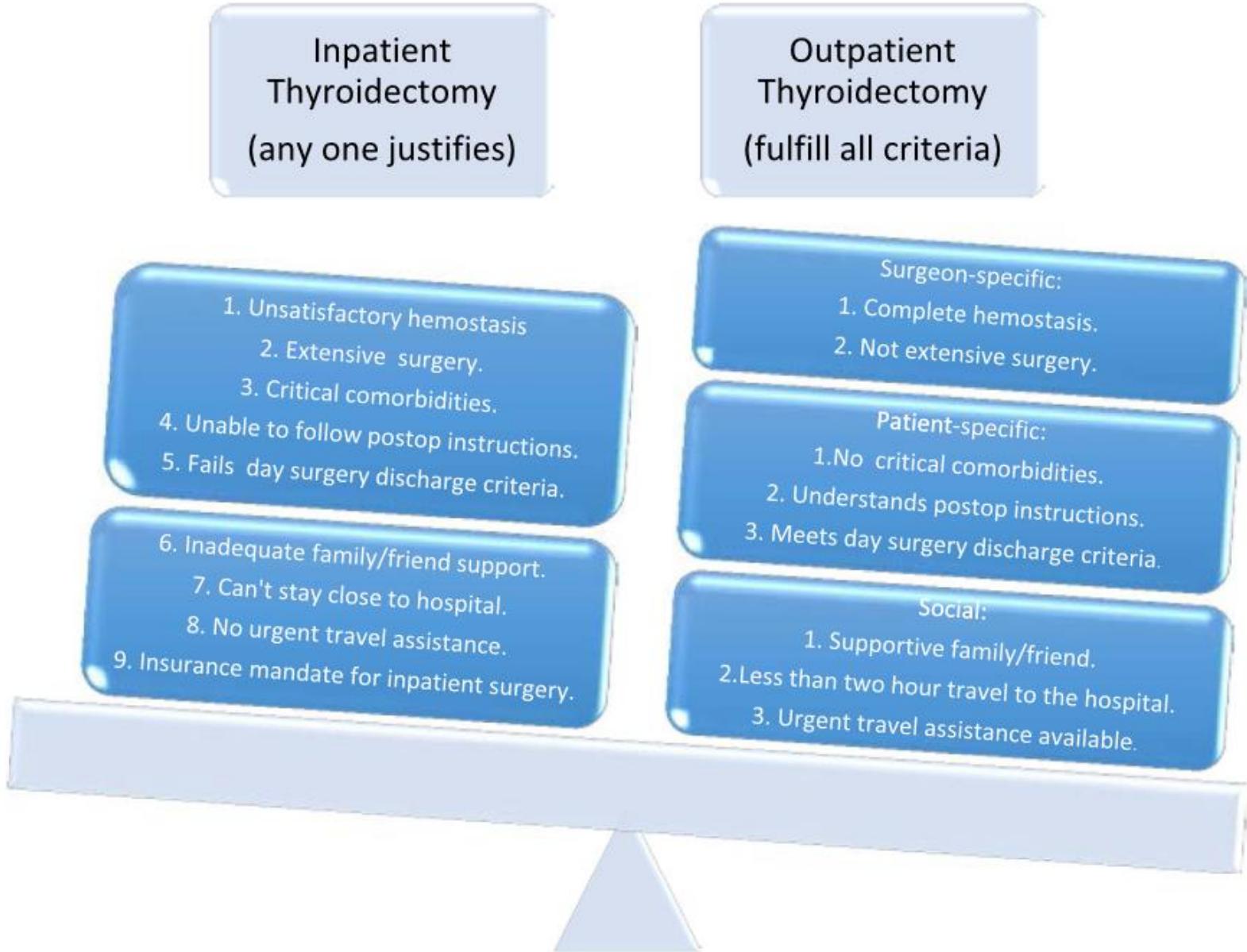


Figure 1. Factors influencing decision for inpatient vs. outpatient thyroidectomy.

Pre-op ? Lap v open

Intra-op – should I convert to open?

- Adrenocortical carcinoma? and adrenalectomy
- Surgical decision making and timing

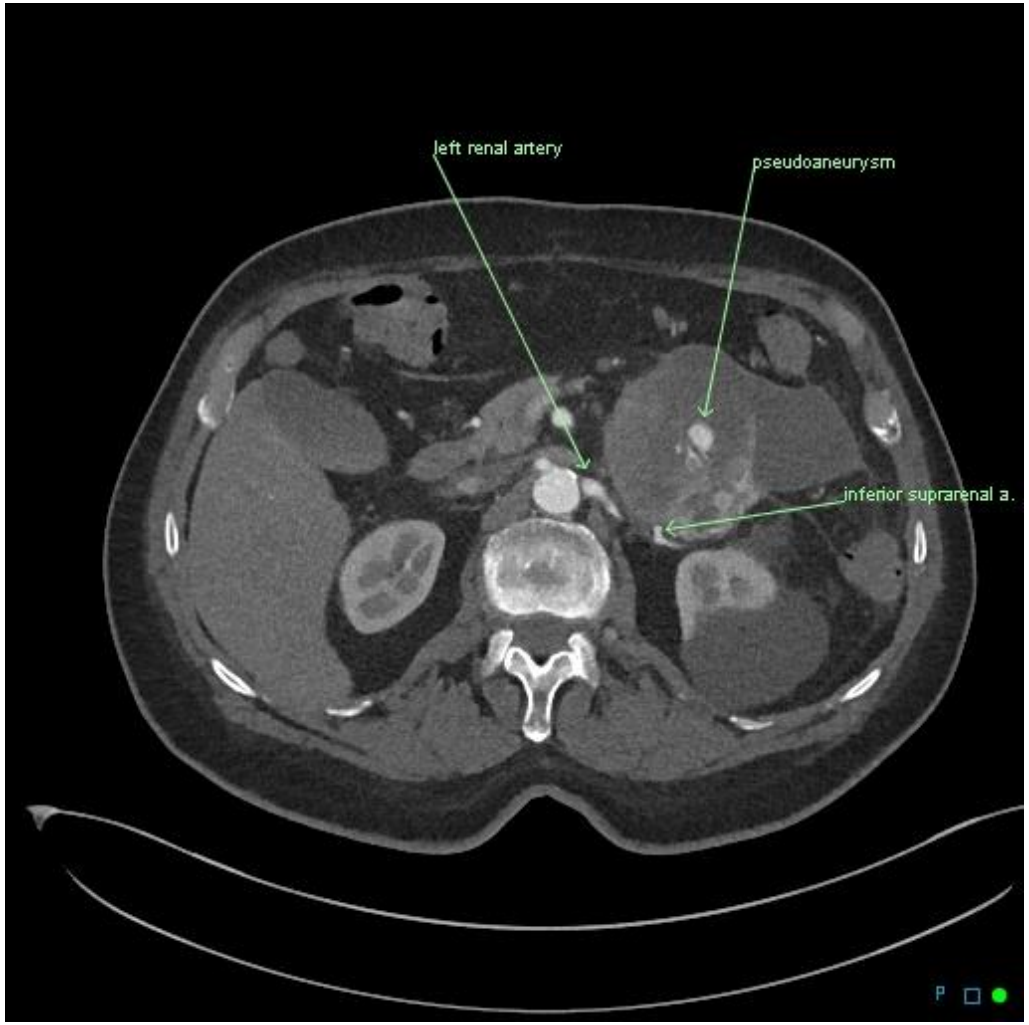
Great laparoscopic surgery until

Tumour spillage or incomplete surgery

Call a friend – vascular, cardiothoracic, Gi surgeon #### preplan

OPEN ADRENALECTOMY CASE 1

Undifferentiated spindling cell sarcoma



OPEN ADRENALECTOMY
CASE 2

- 60yr old female
- Non functioning
- Incidentaloma
- Ganglionoma
- Adherent to IVC

ADRENOCORTICAL CARCINOMA SURGICAL TRENDS

ACC patients with localized disease were identified in the National Cancer Database from 2010 to 2014.

Calcatera N et al. World J Surg (2018) 42: 473-481
DOI 10.1007/s00268-017-4290-2

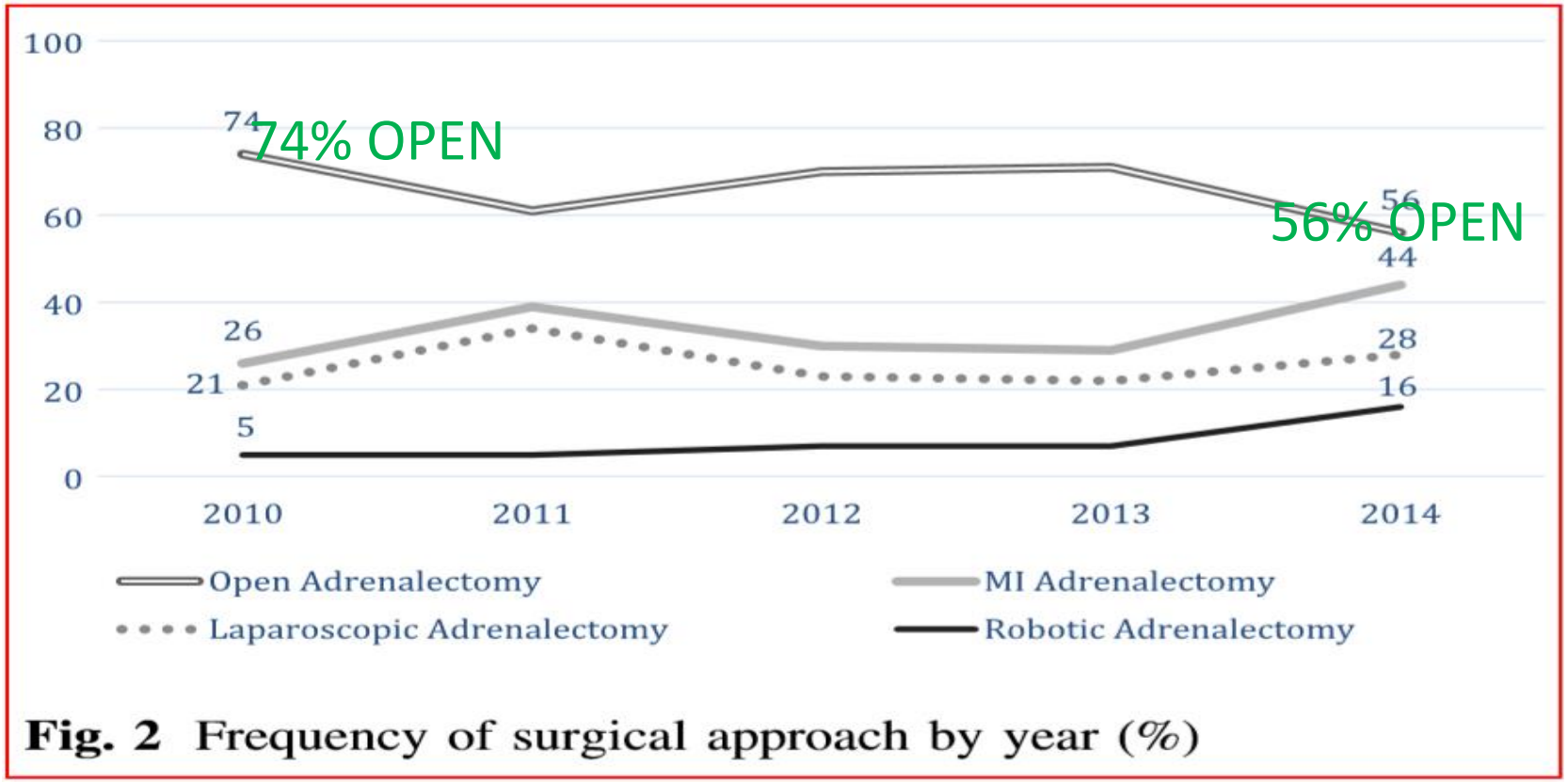


Fig. 2 Frequency of surgical approach by year (%)

ADRENOCORTICAL CARCINOMA AND SURGERY

IMPACT OF CONVERSION TO OPEN SURGERY

- Complete removal and associated viscera required. This decision best made pre-op
- Tumours soft and fragile, risk of rupture
- Microscopic tumour on surface
- Intact specimen gives the best quality histology report
- Upgrade from Stage 1-2 to Stage 3: 25%-30%
- Risk of peritoneal carcinomatosis greatest after Laparoscopic Adrenalectomy (LA)
  - 60% LA and 25% OA
- Surgical studies need to report local, peritoneal and distant metastases

ADRENOCORTICAL CARCINOMA AND SURGERY CONVERSION AND SURVIVAL

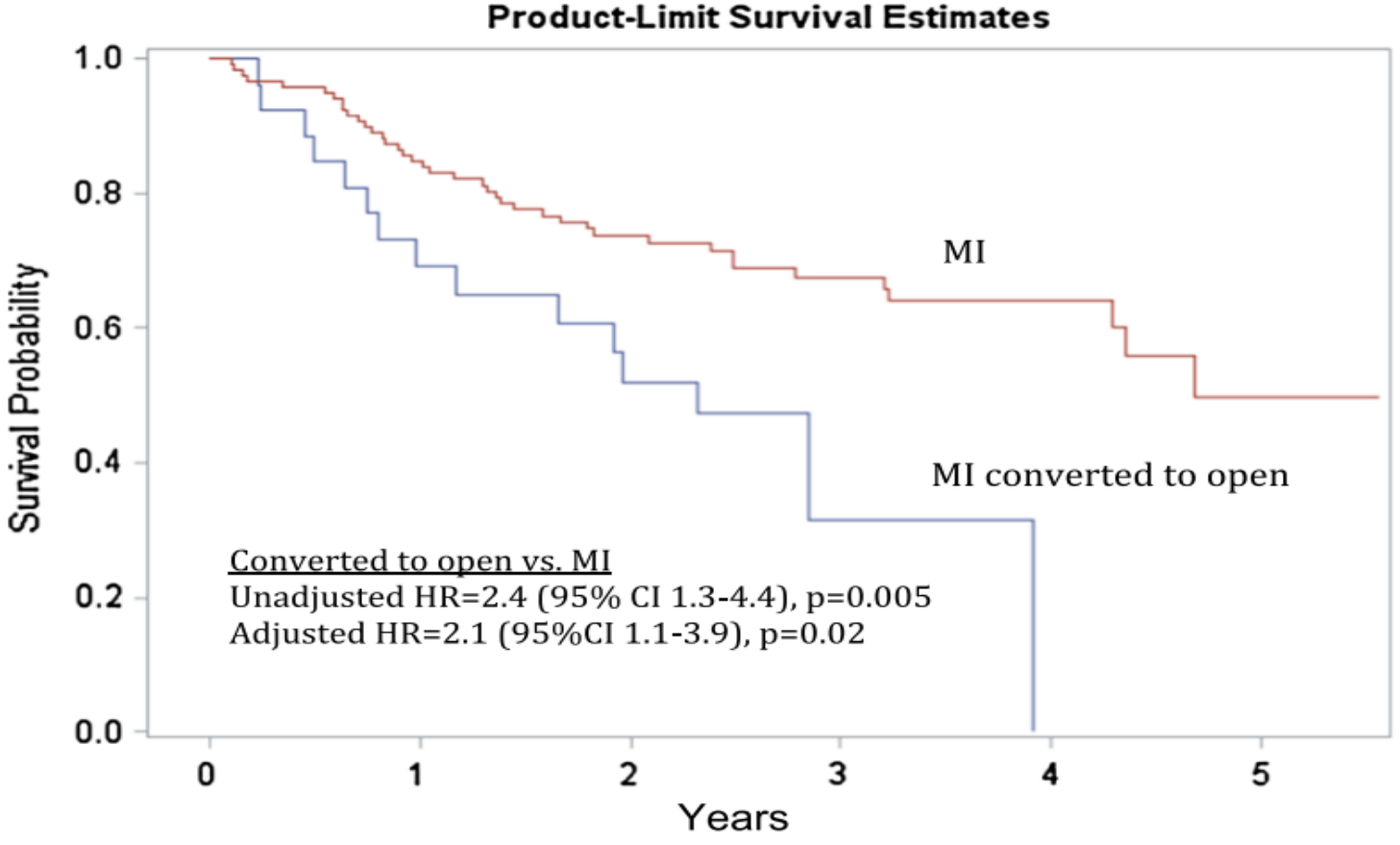


Fig. 3 Overall survival for patients with ACC with a minimally invasive procedure versus converted to an open operation

Calcatera N et al. World J Surg (2018) 42: 473-481
DOI 10.1007/s00268-017-4290-2

OPEN ADRENALECTOMY CONCLUSIONS

- Trend to increasing minimally invasive adrenalectomy
- OA - very uncommon procedure
- Initial poor surgery LA or OA can rarely be corrected
- Decision for OA based on close review of radiology and MDM
- Obviously malignant and highly suspicious tumours – OA
- OA allows wider excision, en bloc excision, vascular control
- Approximately 20% adrenalectomies require OA
- 30% - 60% ACC - OA
- Work as a team
- Refer/consult high volume centre

Thyroidectomy - Parathyroid preservation - Operative options

Hypoparathyroidism commonest complication of total thyroidectomy

- Temporary Hypoparathyroidism 10-20%
- Permanent Hypoparathyroidism 2-5%

Technique taught is careful PT dissection and insitu PT preservation

Dilemmas at Surgery

- Can’t find all the PTs
- One or several look discoloured
- One or several become totally devascularized
- (Parathyoid found by the pathologist)

Which if any parathyroid(s) should be reimplanted?

Thyroidectomy - Parathyroid preservation - Operative options

- Mid 1970's – liberal/routine auto-transplant of diced PTs into ipsilateral sternomastoid muscle

- Evidence of function limited – some function but hard to confirm
- Increased permanent hypoparathyroidism
- Transplant of "normal parathyroid different to "hyperplastic" parathyroid
- Lille study: In situ PT preservation and delayed 1month high-normal Ca best predictors of PT recovery

Thyroidectomy - Parathyroid preservation - Operative options

Present

Excision/transplant of the most discoloured ?ischaemic parathyroid – widely adopted

- Colour not reliable assessment of function
- Venous congestion maybe less risk of permanent hypoparathyroidism than “normal” looking glands which have ischaemia

Recommendation: Auto-transplant non viable PT only

iPTH 4-6 months postop best predictor of permanent hypoparathyroidism

Langenbeck's Archives of Surgery (2018) 403:309–315
https://doi.org/10.1007/s00423-018-1654-5

REVIEW ARTICLE

Parathyroid autotransplantation in thyroid surgery

Antonio Sitges-Serra[1,2] · Leyre Lorente-Poch[1] · Juan Sancho[1]

Table 1 Influence of the number of parathyroid glands preserved in situ on short- and long-term parathyroid function after total thyroidectomy

	PGRIS 1–2 ($N=43$)	PGRIS 3 ($N=186$)	PGRIS 4 ($N=428$)	*P* value
Hypocalcemia ($n=278$) ($sCa^{24h}<8.0$ mg/dL)	32 (74)	95 (51)	155 (36)	<0.0001*
Protracted hypoparathyroidism ($n=121$) ($iPTH^{1mo}<13$ pg/mL)	19 (44)	46 (25)	56 (13)	<0.0001*
Permanent hypoparathyroidism ($n=30$) ($iPTH^{1y}<13$ pg/mL ±Ca/Vit.D treatment)	7 (16)	12 (6.5)	11 (2.6)	<0.0001*
sCa postop ^{24h} (mg/dL)	7.6 ± 0.9	7.9 ± 0.8	8.2 ± 0.8	<0.0001†
$iPTH^{24\ h}$ (pg/mL)	7.4 ± 7	6.5 ± 8	24.3 ± 21	<0.0001†
$iPTH^{1\ mo}$ (pg/mL)	19.7 ± 23	28 ± 25	37 ± 28	<0.0001†

Thyroidectomy - Parathyroid preservation - Techniques

Technique of Parathyroid Auto-transplantation (primary HPT)

1. Dice PT, insert into muscle pocket and suture closed
2. Dice PT, mix in 1-2 ml NACL, inject with wide bore needle e.g 18g into muscle

NB Use ipsilateral sternomastoid muscle

Case Report

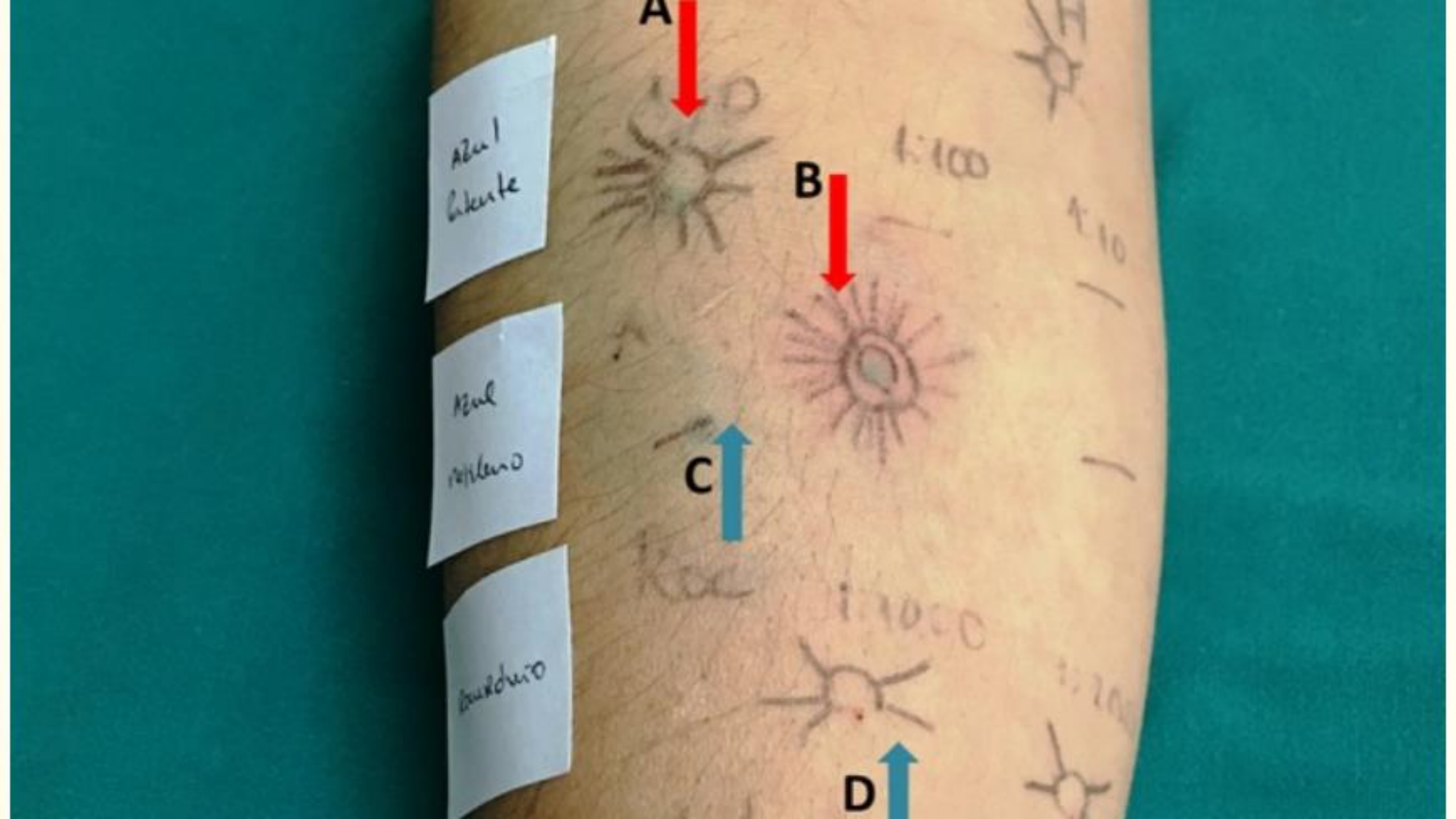
Up front SNB prior to mastectomy and immediate reconstruction
Dual technique – isotope and patent Blue dye
Anaphylaxis
Two Anaesthetists
Tryptase sent as for anaphylaxis protocol
2-3 days in ICU
Oedema++
Long term vestibular symptoms = post concussion syndrome
Psychological symptoms and employment
Skin testing
Document

Perioperative anaphylaxis
Commonest – neuromuscular blocking drugs, latex, antibiotics

Patent Blue Dye Allergy(0.56% allergic reaction, 0.06% severe anaphylaxis)

Used in NZ for breast and melanoma SN surgery
Dual Isotope and blue dye – decrease false negative rate
Suggestive of IgE - mediated hypersensitivity

Grade 1 (69-87%) urticaria, blue wheals, pruritis, rash
Grade 2 (3.2-8%) transient hypotension (Systolic BP <70mmHg), no need for vasopressors and/or bronchospasm
Grade 3 (1.1%) severe CV collapse, vasopressors, stop procedure, ICU
Grade 4 (< 1%) respiratory or CV failure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Breast and Endocrine Surgery : Complications
Conclusion

Things can go wrong for any surgeon. This can be global, hospital or team level, or at individual level

Take a breath, pause, slow your pulse down, panicking doesn't help

Speedy response required in thyroid surgery

Need to have plans in place for emergencies

Colleagues and reliable team essential

Debrief, thank the team for all their help

Remember the patient /family can have ongoing anxiety after a major complication as can the surgeon