Clinical negligence in Intensive Care and Anaesthesia

- Review of expert witness requests over 5 years

- Complaints submitted to Anaesthetic department at Southmead Hospital

Confidentiality

- Airway complications
- Management of sepsis
- Vascular access

Airway complications

British Journal of Anaesthesia **109** (S1): i68–i85 (2012)
doi:10.1093/bja/aes393

BJA

RESPIRATION AND THE AIRWAY

Complications and failure of airway management

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- Review of claims in US, Canada, UK

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland

Anaesthesia, 2010, **65**, pages 556–563 doi:10.1111/j.1365-2044.2010.06331.x

ORIGINAL ARTICLE

Litigation related to airway and respiratory complications of anaesthesia: an analysis of claims against the NHS in England 1995–2007

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2 Consultant Anaesthetist, Oxford Radcliffe Hospitals, Oxford, UK

Claims notified to the NHS Litigation Authority in England between 1995 and 2007

The total cost of (non-dental) airway claims was £4.9 million (84% closed, median cost £30 000)

Case history: Airway

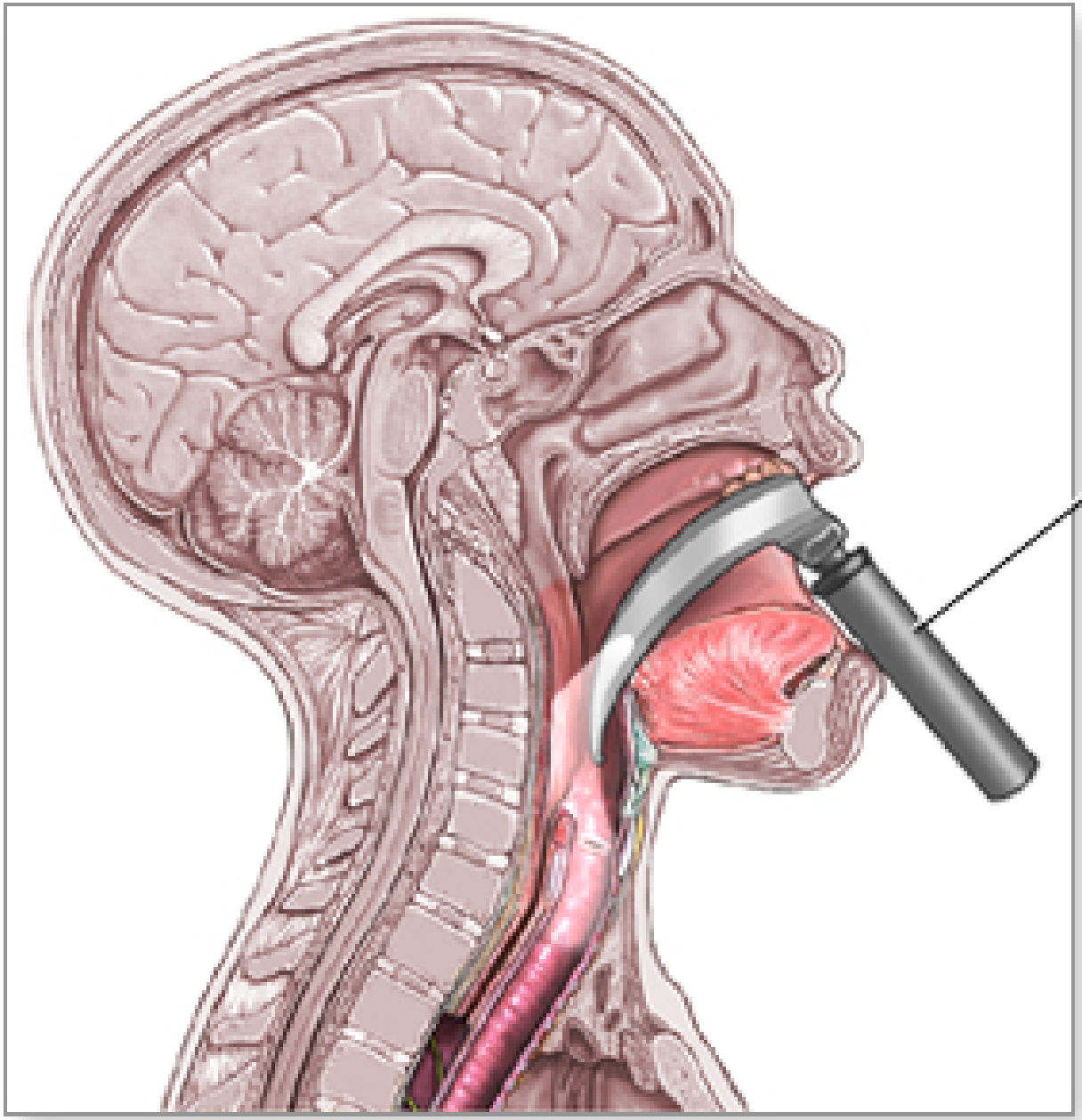
- Young man with severe tonsillitis including upper airway signs (drooling, noisy breathing)
- Treated with antibiotics, observed on ward
- 2.00 AM respiratory arrest due to airway obstruction
- Cardiac arrest team unable to intubate

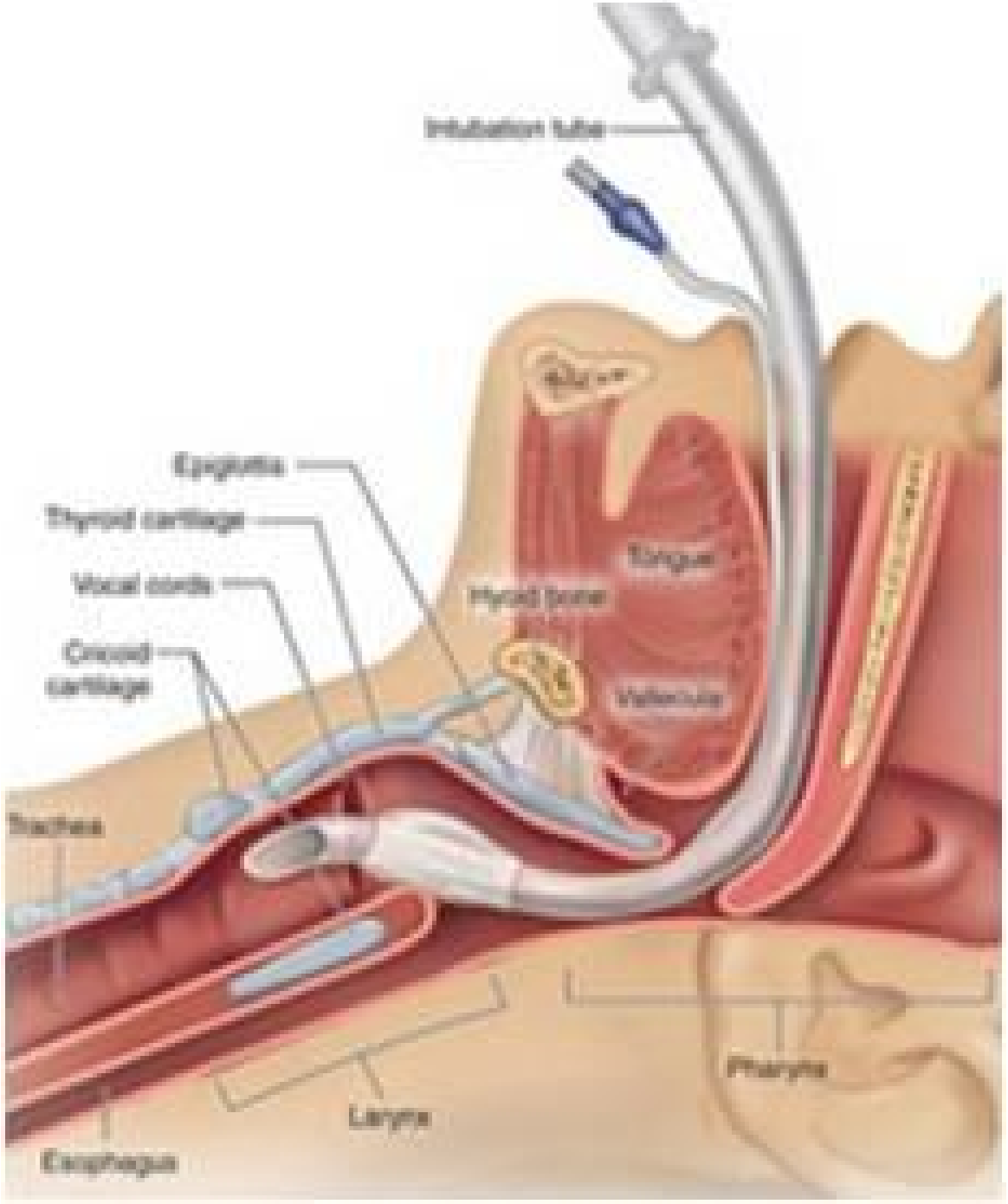
- Cardiac arrest team attempted to oxygenate with mask, bag, airway devices
- 40 minutes of very poor oxygenation
- Consultant anaesthetist arrived, intubated
- Hypoxic brain injury

Intubation

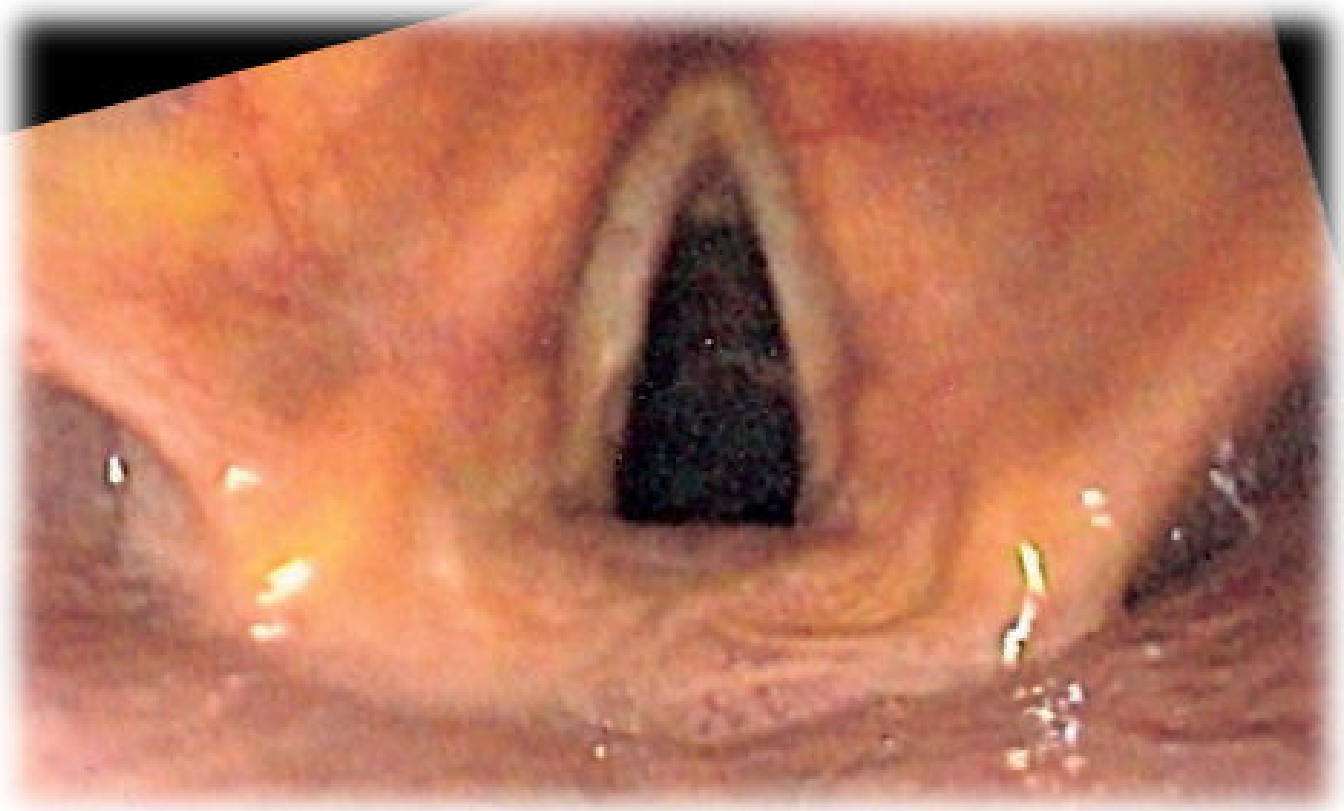
- Tube inserted into trache
- Usually via mouth
- Passes through vocal cords (larynx)
- Cuff allows air tight seal

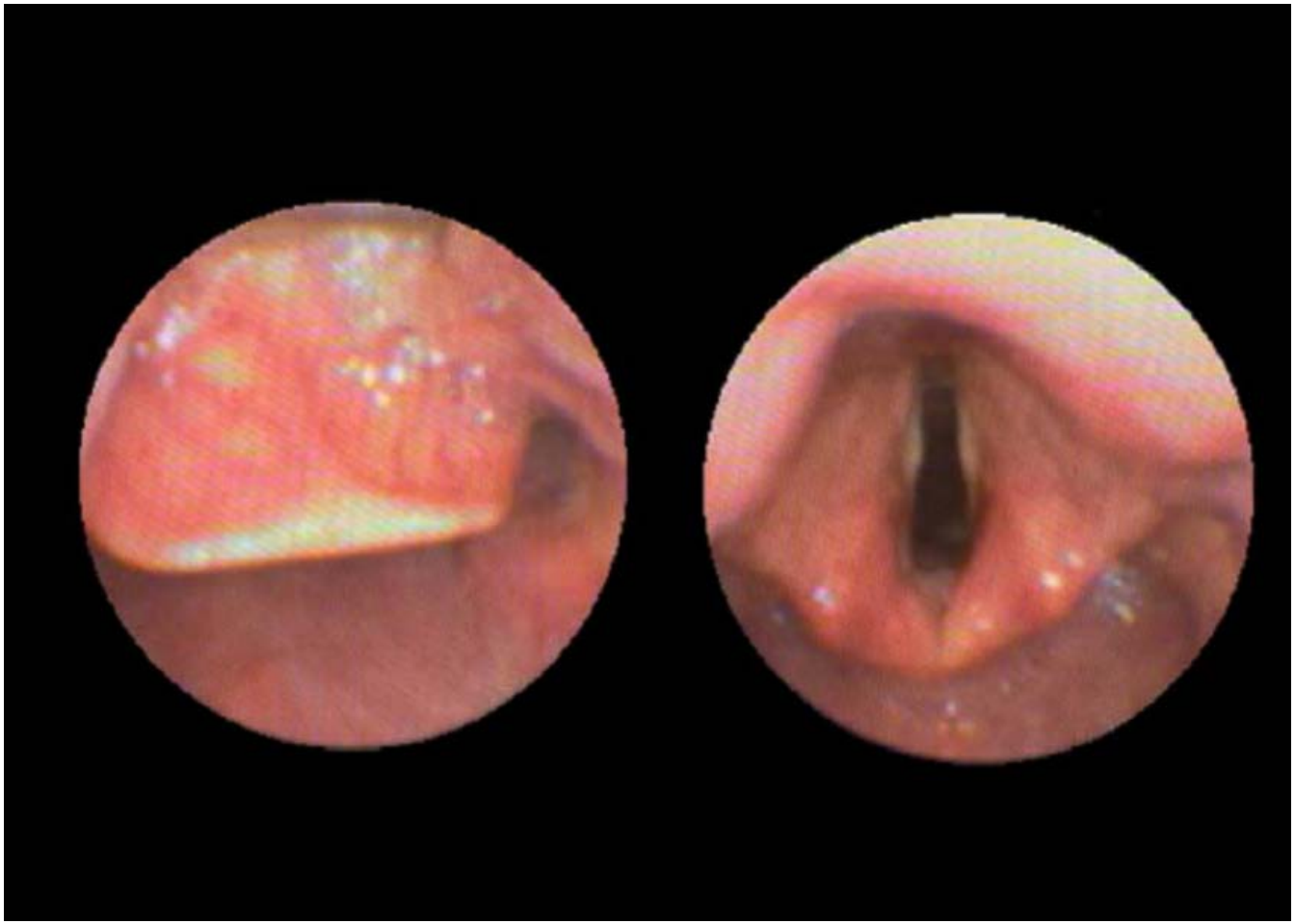
- Laryngoscope used

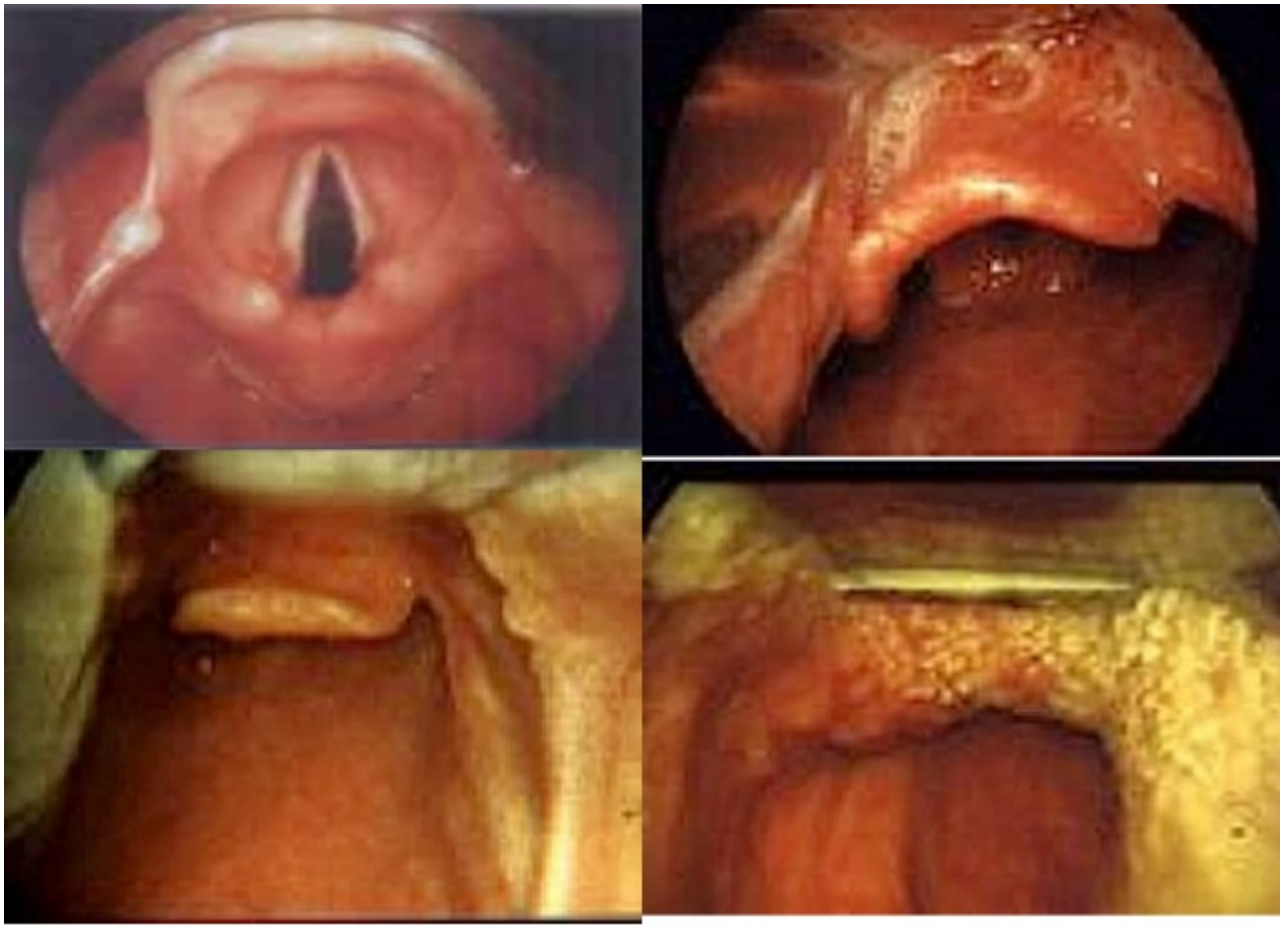

Laryngosco


Intubation tube
Epiglottis
Thyroid cartilage
Vocal cords
Cricoid cartilage
Tongue
Hyoid bone
Vallecula
Trachea
Pharynx
Larynx
Esophagus

Larynx (vocal cords







Can’t intubate can’t ventilate

- Difficult Airway Society (DAS) guidelines

- If unable to intubate and oxygenate proceed with surgical airway

British Journal of Anaesthesia **113** (2): 220–5 (2014)
doi:10.1093/bja/aeu227

BJA

Observational study of the success rates of intubation and failed intubation airway rescue techniques in 7256 attempted intubations of trauma patients by pre-hospital physicians

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[2] School of Clinical Sciences, University of Bristol, Bristol, UK

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- 100% success with emergency surgical airway when needed

4th National Audit Project (NAP4)

10

The Royal College of Anaesthetists

The Difficult Airway Society

The National Patient Safety Agency
Patient Safety Division

The Intensive Care Society

The College of Emergency Medicine

4th National Audit Project of
The Royal College of Anaesthetists and The Difficult Airway Society

Major complications of airway management in the UK

NAP4

Report and findings
March 2011

NAP 4

- Obese patients are twice as likely to develop serious airway problems during a general anaesthetic than non-obese patients

- the use of a simple breathing monitor (capnograph, could significantly reduce deaths and brain damage from such problems in intensive care units (ICUs)

- absence of capnography contributed to 74% of deaths from these events in ICUs during the study.

Key points

- Very little time to resolve problem
- Equipment
  - Capnography (measuring carbon dioxide)
  - Video scope
- Expertise
  - Senior / Consultant anaesthetist

- If all else fails don’t hesitate to cut neck

Sepsis

Sepsis

- 100000 cases per year in UK
- 37000 deaths per year in UK (Ca colon+Breast)
- Huge variation in sepsis outcome
- Potential for significant improvement

Why do clinical negligence claims arise?

- Sepsis may present in many ways
  - Missed diagnosis
  - Missed severity
- Early recognition saves lives

- Treatment requires repeated assessment and intervention
  - Difficult to achieve in a ward setting

Sepsis 2016 definition

- A patient with suspected infection with:
  - An alteration in mental status
  - A decrease in systolic blood pressure to less than 100 mm Hg
  - A respiration rate greater than 22 breaths/min
- Mortality with 2 or more is 10%

Septic shock

- Patients with sepsis who
  - Require inotropes (eg adrenaline) to keep their blood pressure up
  - Have a blood lactate of > 2 mmol/l
- If both present mortality is 40%

Case history (1)

- 70 year old lady presented with confusion, fever, high lactate (12)
- Diagnosis of probable pneumonia
- Admitted to ward and treated with
  - Antibiotics
  - Fluids

- Not referred to ICU

Case history (1)

- 48 hours of ward care
- Low blood pressure
- Reduced urine output

- Septic shock
- ICU felt treatment futile: died

Case history (1)

- Failure to monitor treatment progression
- Failure to respond to deterioration
- Delayed referral to ICU

Case History (2)

- 68 year old man admitted with features of pneumonia (ie sepsis; lung infection)
- Initial treatment with oral fluids and oral antibiotics
- 12 hours later progressed to septic shock
- Treatment changed to IV fluids and antibiotics

Case History (2)

- 12-24 hours
  - 2 litres of intravenous fluid
  - Occasional observations taken (with low BP)
- Continued deterioration
- Died in ICU (24 hours post admission)

Case History (2)

- Infrequent observations
- No action taken for low BP
- Inadequate intravenous fluids given

- Low BP should have prompted ICU admission and inotropes (eg adrenaline)

Intensive Care Med (2013) 39:165–228
DOI 10.1007/s00134-012-2769-8

GUIDELINES

Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock, 2012

R. P. Dellinger
Mitchell M. Levy
Andrew Rhodes
Djillali Annane
Herwig Gerlach
Steven M. Opal
Jonathan E. Sevransky
Charles L. Sprung
Ivor S. Douglas
Roman Jaeschke
Tiffany M. Osborn
Mark E. Nunnally
Sean R. Townsend
Konrad Reinhart
Ruth M. Kleinpell
Derek C. Angus
Clifford S. Deutschman
Flavia R. Machado
Gordon D. Rubenfeld
Steven Webb
Richard J. Beale
Jean-Louis Vincent
Rui Moreno
The Surviving Sepsis Campaign Guidelines Committee
including The Pediatric Subgroup*

Sepsis guidelines

- Surviving sepsis campaign published guidelines in 2004,2008,2012

- Comprehensive guidelines for all types of sepsis
- Initial ICU uptake
- Uptake outside ICU over last 3-5 years

Key points

- Sepsis is
  - Often missed
  - Severity is often under-estimated
- Frequent observations / Scoring systems
- Treatment guided by repeated observations

Causation

- How we determine if breach of duty caused worse outcome?
- Epidemiological studies
- Risk calculators

Epidemiological studies

- Sepsis
  - Patients stratified according to severity
  - Need to adjust for co-morbidity
- Pneumonia (eg CURB65)
  - Scoring used to adjust treatment but also predicts outcome

ICU risk calculators

- Acute Physiology And Chronic Health Evaluation
- APACHE 2
- Can be used to estimate risk of death for any ICU admission (or patient requiring ICU)

APACHE 2

- 12 Acute physiology variables
  - Oxygen level, blood pressure, coma score etc

- Points for chronic health
- Diagnostic group

- Predicts mortality rate

APACHE II Calculator

Age: < or = 44 **Hematocrit**: 30 - 45.9%

WBC: 3000 - 14900 **Rectal Temp**: 34 - 35.9 °C F-->C

MAP 70-109 MAP= [(2 x diastolic)+systolic] / 3

Heart Rate: 70-109 **Respiratory Rate**: 12-24

Serum Sodium(meq/L) 130 - 149 **Serum K+**(meq/L) 3.5 - 5.4

Calculate Aa gradient if FIO2 >or= 0.5 (Oxygenation)

Arterial pH: 7.33- 7.49

Serum Creatinine (mg/dl): 0.6 - 1.4 AND not acute renal failure

History of severe organ insufficiency (heart, liver, kidney, other) or immunocompromised?

No

Glasgow Coma Scoring:

Eye Opening: Spontaneous Verbal: Oriented

Motor: Obeys Commands

Calculate Apache 2 Score Reset

Head injury risk

- Risk Adjustment In Neurotrauma (RAIN study)
- Very large head injury database
- Allows prediction of likely outcome from head injury

Risk prediction models

- Not to be used to make clinical decisions for individuals

- Best way of predicting “balance of probabilities”:

Eg: 35% vs 65% predicted outcome

Head injury prognosis

These prognostic models may be used as an aid to estimate mortality at 14 days and death and severe disability at six months in patients with traumatic brain injury (TBI). The predictions are based on the average outcome in adult patients with Glasgow coma score (GCS) of 14 or less, within 8 hours of injury, and can only support - not replace - clinical judgment. Although individual names of countries can be selected in the models, the estimates are based on two alternative sets of models (high income countries or low & middle income countries).

Country	United Kingdom
Age, years	66
Glasgow coma score	6
Pupils react to light	Both
Major extra-cranial injury?	No
CT scan available?	☑

Presence of petechial haemorrhages	No
Obliteration of the third ventricle or basal cisterns	No
Subarachnoid bleeding	Yes
Midline shift	No
Non-evacuated haematoma	Yes

Prediction

Risk of 14 day mortality (95% CI)	**38.5% (29.2 - 48.8)**
Risk of unfavourable outcome at 6 months	**80.2% (73.5 - 85.6)**

Central venous access

Central venous access

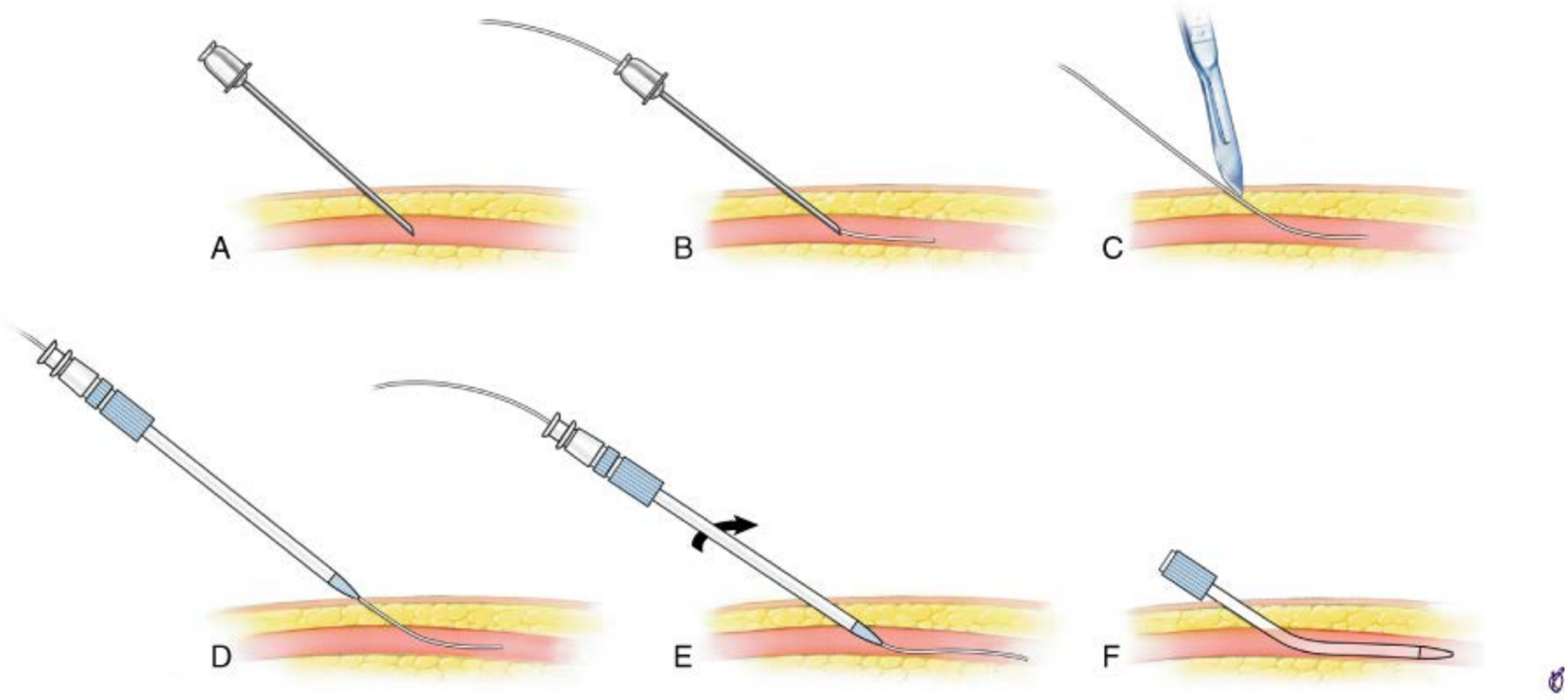
- Sites
  - Femoral vein groin
  - Jugular vein neck
  - Subclavian vein upper chest
- Uses
  - Drugs
  - Monitoring (pressure)
  - Dialysis

Complications

- Malposition
  - Arterial
  - Chest
- Bleeding
  - Insertion
  - Removal
- Damage to adjacent structures
  - Arteries, nerves, lung

Insertion

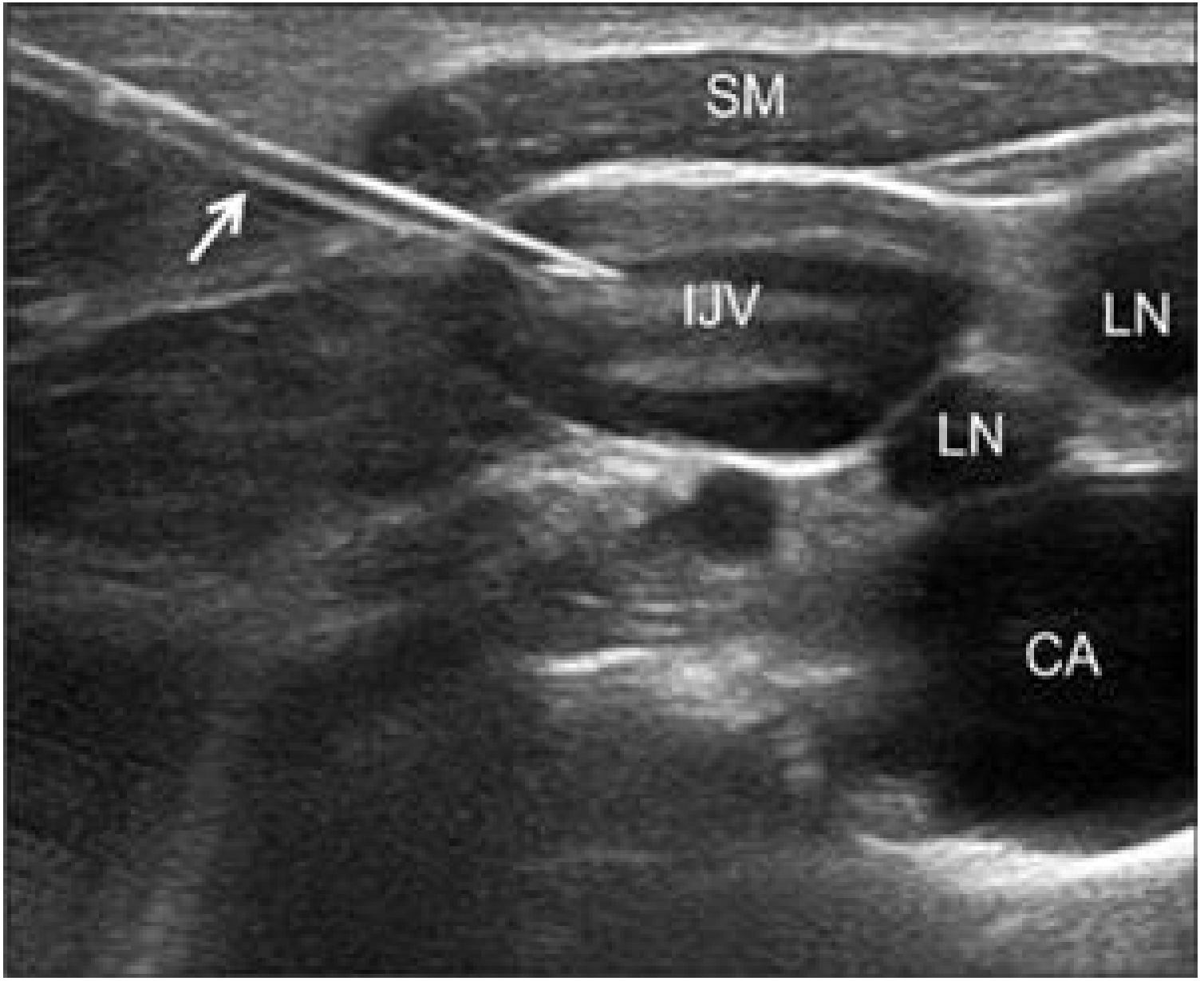
- Seldinger technique
  - Needle in vein
  - Wire through needle
  - Needle out
  - Dilator over wire
  - Catheter over wire



Imaging

- Insertion
  - Ultrasound scan
  - Image intensifier (xray)

- Post procedure
  - Xray
  - “Contrast Xray”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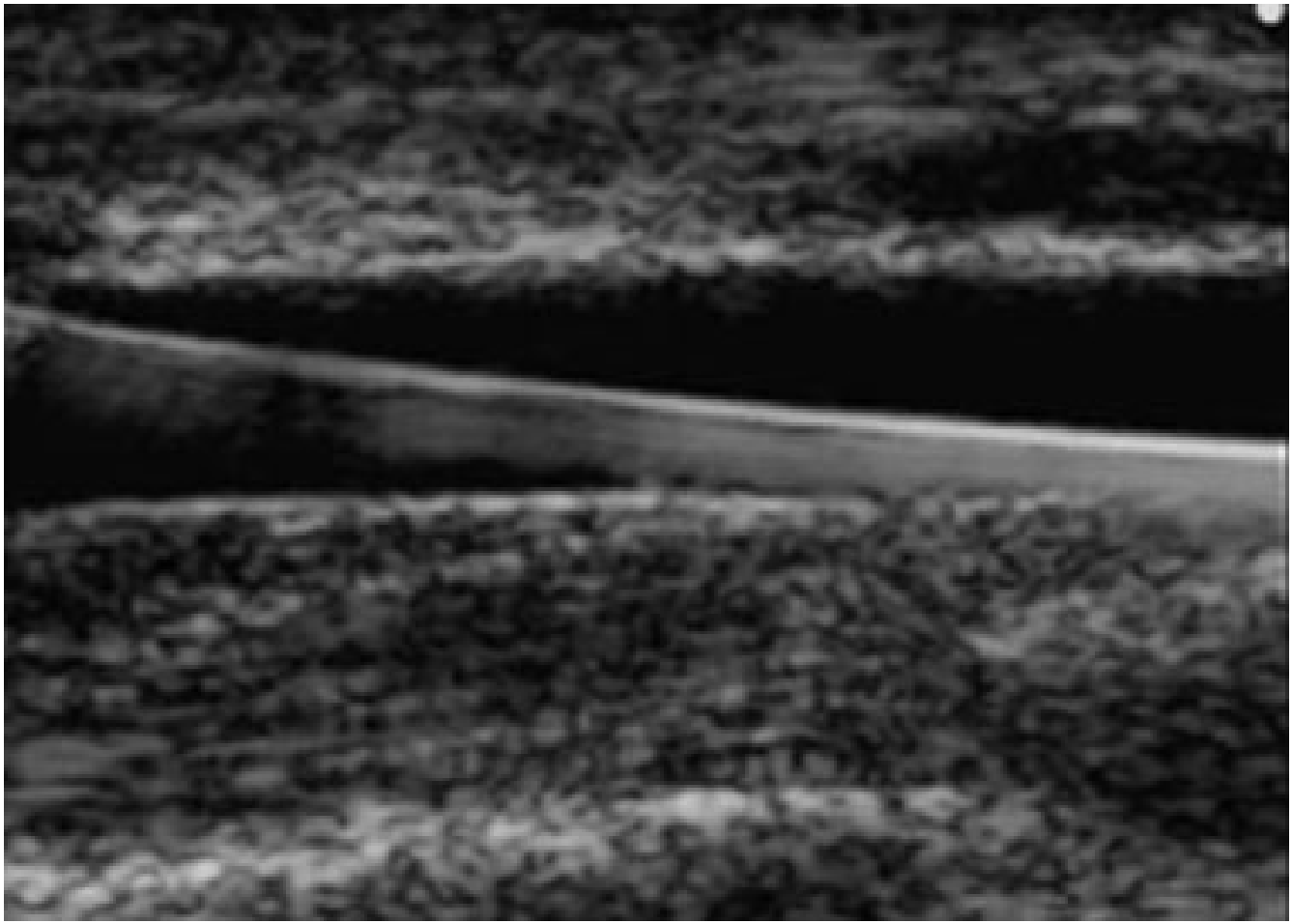


Case history

- 50 year old listed for complex gynae surgery
- Attempted central line at start of procedure
- Patient known to have goitre
- Ultrasound guided R jugular vein
- Able to insert needle
- Unable to advance wire
- Abandoned

Case history

- Post op re attempted line
- Needle inserted
- Guide wire inserted
- Dilated
- Line inserted
- Unable to remove guide wire

Case history

- Re- attempted removal of guide wire
- Guide wire removed with difficulty
- Guide wire “kinked”
- Unable to aspirate blood from central line

- At this stage
  - Used ultrasound
  - Known goitre
  - Experienced operator

  - Kinked guide wire is well recognised
  - Malposition is well recognised
  - Non negligent

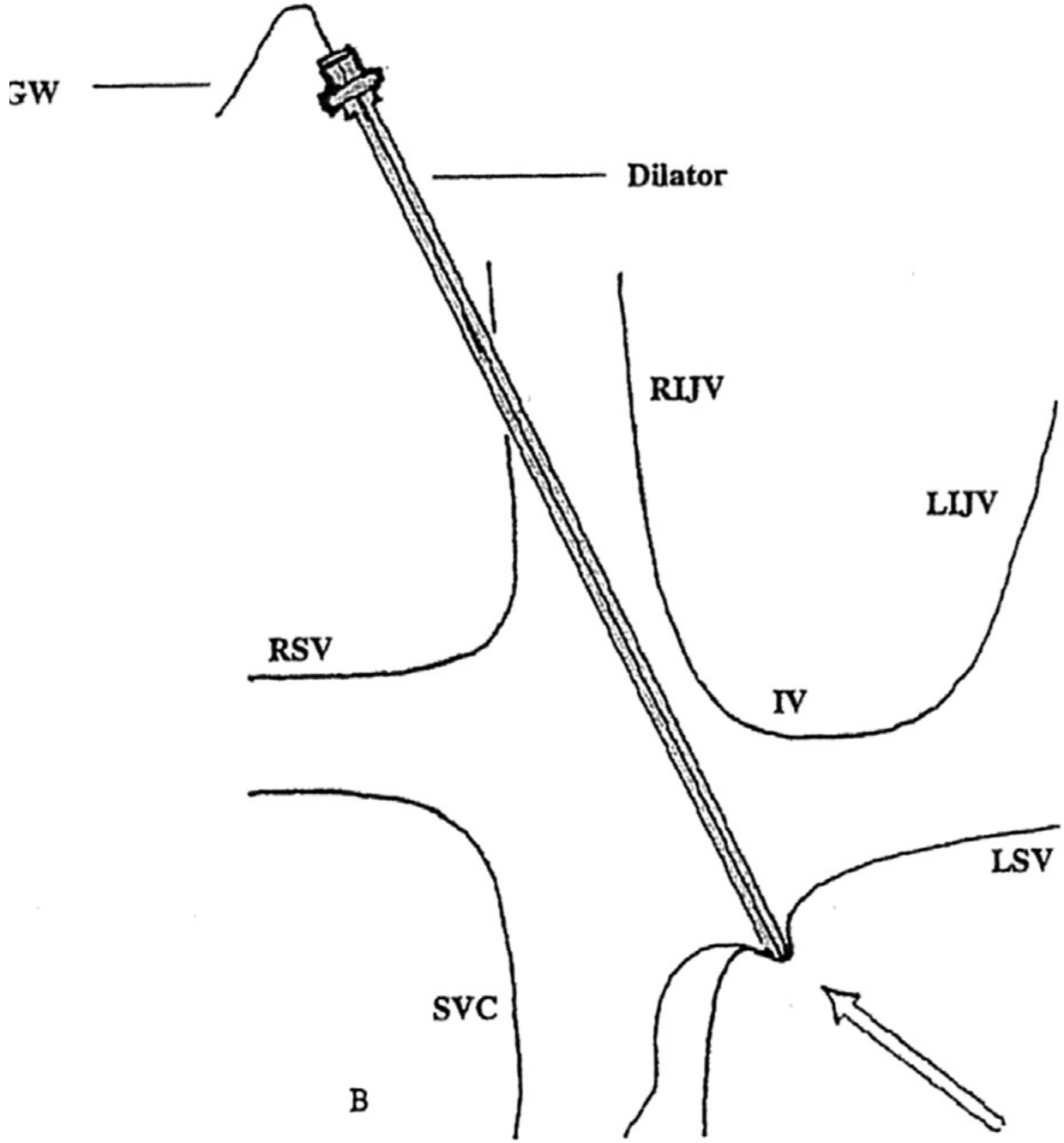
Case history

- Central line removed
- Patient collapsed, low blood pressure
- Chest drained: large volume blood aspirated
- Cardiac arrest: CPR
- Attempted surgery: failed
- X ray guided stents controlled breathing
- Discharged after long ICU stay

Central access

- Initial U/S confirms vein punctured
- Guide wire kinked
- Unable to aspirate line

- Implies line has punctured vein but tip is not in vein
- Likely tip has passed out of vein into chest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Dilator
RIJV
LIJV
RSV
IV
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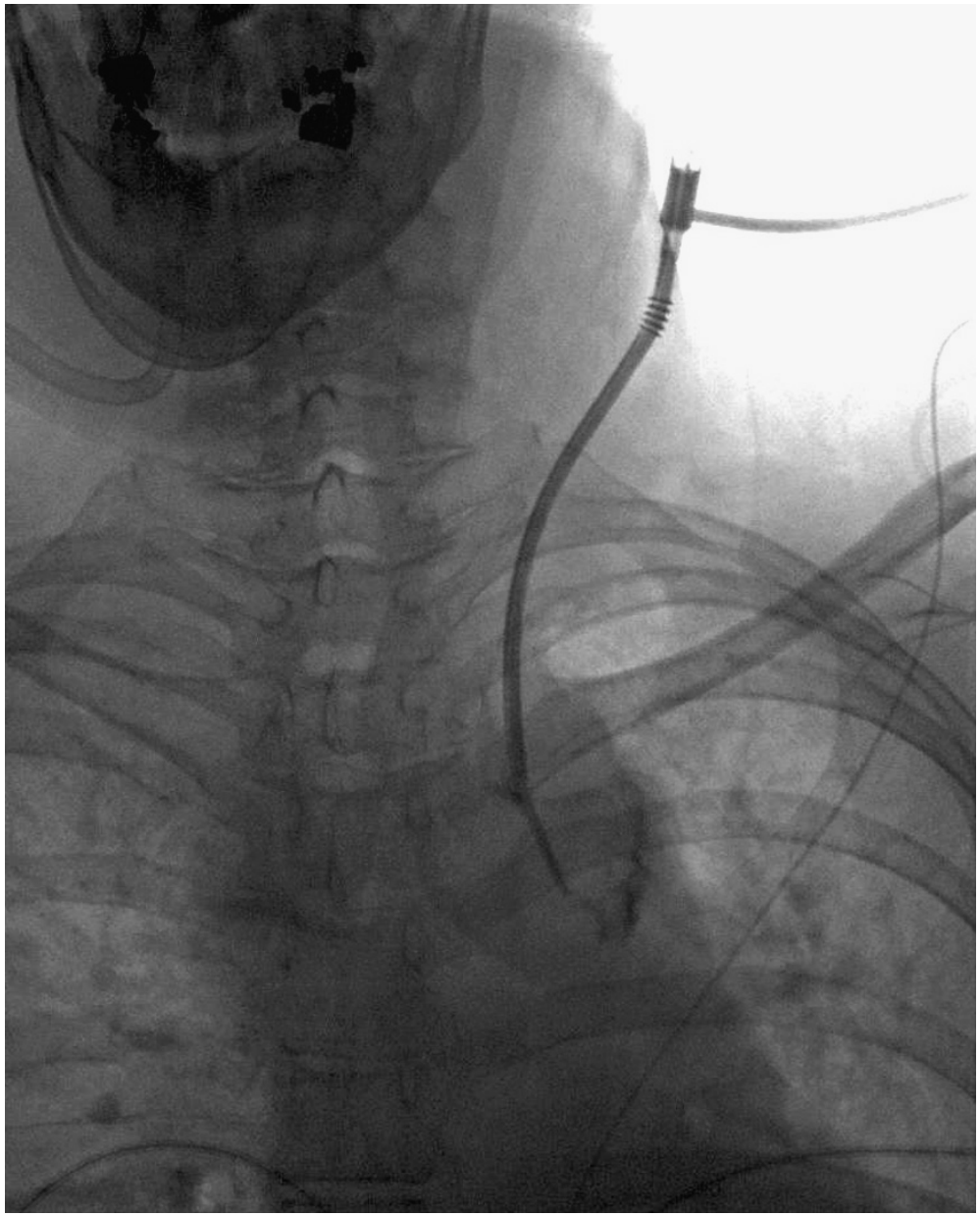
B



British Journal of Anaesthesia Page 1 of 14
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BJA

REVIEW ARTICLE

Misplaced central venous catheters: applied anatomy and practical management

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Central access

- “If in doubt leave it in”
- Imaging should be done prior to removal

- Bolam:
  - "*If a doctor reaches the standard of a responsible body of medical opinion, he is not negligent*".
  - Many anaesthetists would remove the catheter
- Bolitho:
  - *if it could be demonstrated that the professional opinion was not capable of withstanding* ***logical analysis***
  - Not logical to remove catheter

Central venous access

- High risk procedure
- Risk factors include
  - Obesity
  - Repeated access
  - Inexperienced operator
  - Poor supervision

Questions?

- Airway complications
- Management of sepsis
- Vascular access

Intensive care negligence (2)

- Infection control
- Drug errors
- Accidental removal of medical devices

Intensive care non negligence issues

- End of life decisions
- Treatment limitation
- Consent
- Mental capacity

- Personal injury claims