

Surgical Techniques to Minimise Blood Loss

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Vascular Surgery
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Trouble

Getting out vs staying out



Poor planning on your part...

Elsewhere

- Pre optimisation
 - Ownership
- Cell salvage
- Permissive anaemia
- Drugs – on the whole

Personal perspective

- Pre-op
- Pre-incision
- Peri-operative
- (Post op)

First Contact

Primary reason for referral: Peripheral vascular disease

Referral letter:

Dear Colleague,

I would be most grateful if you may be able to meet up with this 81 year old lady who is presenting with increasing peripheral vascular disease. She describes getting significant pain in her right calf after walking 50 yards up a hill. This settles relatively quickly and then returns again with walking. She is aware that her feet are becoming increasingly cold.

This lady has a past history of impaired glucose tolerance and hypertension. She has never smoked tobacco.

Indication for Surgery

- Should we be operating at all?
- Risk vs. Benefit
 - Patient expectations
 - Triumph of technique...
- Urgency
 - Benign vs. malignant (not just cancer)
- Alternatives
 - Minimally invasive
 - Medical management

Medications

- Warfarin / NOACs
 - Indications
 - Bridging
- Antiplatelet agents

Single

- Managable
 - Minor - inter
- Bleeding risk
- How risky is bleeding?
 - Neuro
 - Ophthalmic
 - Plastics
- CVS risk

Dual Coronary Stenting – Elective

- Cessation
 - High risk of stent thrombosis / MI
 - Prothrombotic
 - Inflammation
 - Dehydration
- 6 weeks > 6 months > 12 months
- Don't forget reloading



Considerations

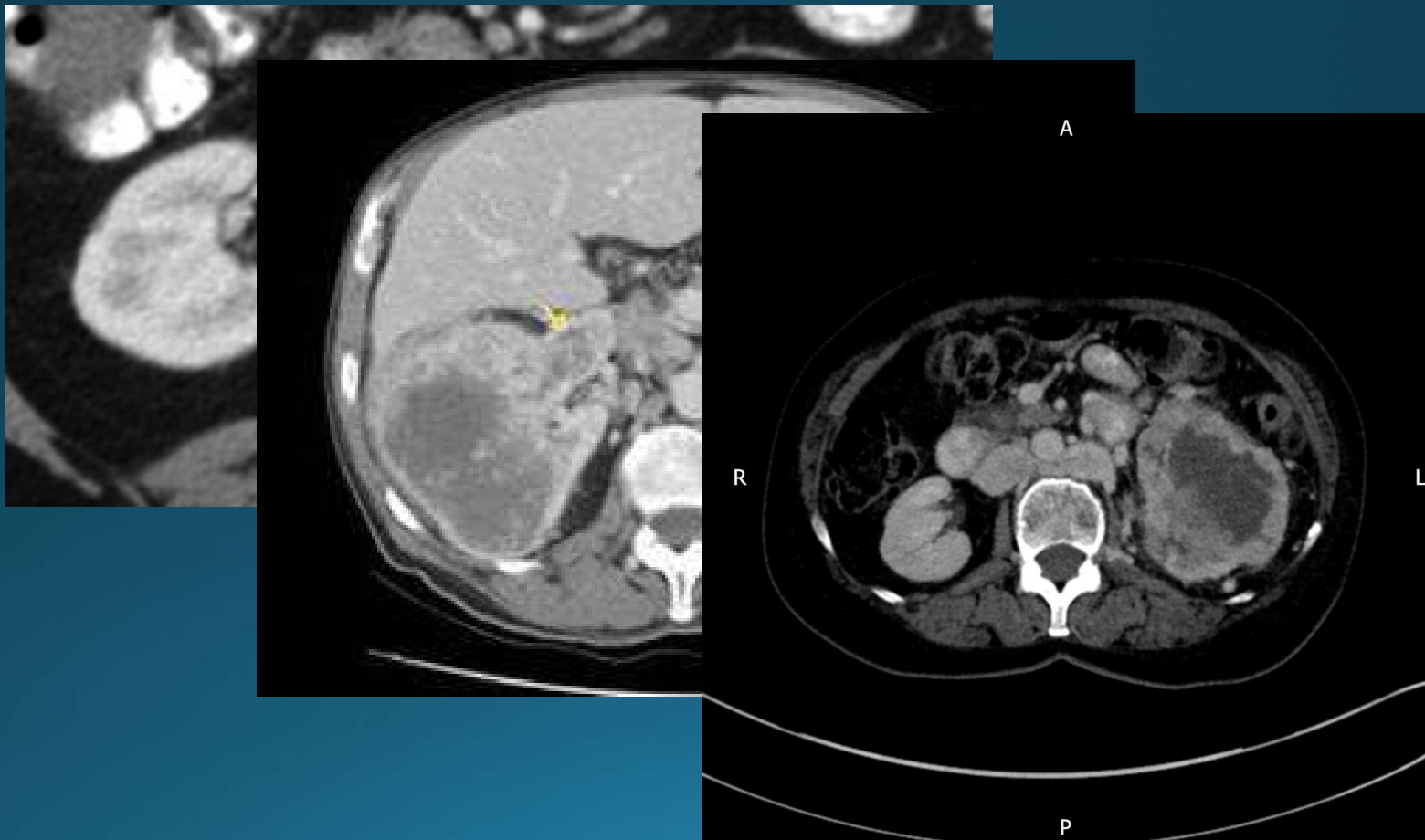
- Defer 12 months Ideal
- Defer 30/7 Bare metal stent
- Defer 6 months Drug eluting
- **MDT - Vital**

Dual Coronary Stenting – Emergency

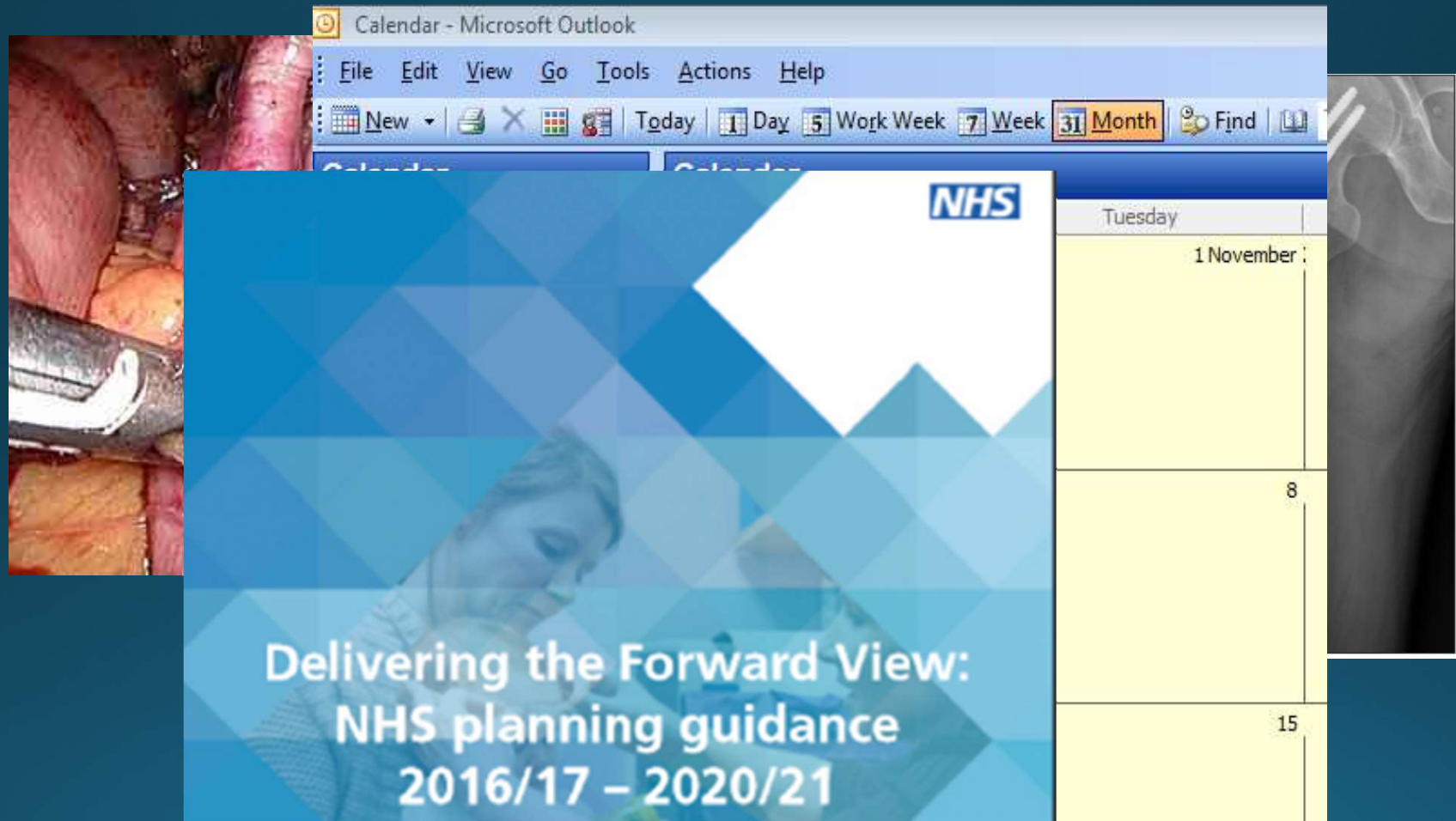
- Phone a friend

Imaging

- If you order it – look at it...



Communicate



The collage features four distinct images:

- Surgical Site:** A close-up photograph of a surgical incision with visible internal organs and a surgical instrument.
- Microsoft Outlook Calendar:** A screenshot of the Outlook interface showing a calendar for Tuesday, 1 November. The calendar is set to 'Month' view and shows dates 1, 8, and 15.
- NHS Planning Guidance:** A document titled "Delivering the Forward View: NHS planning guidance 2016/17 – 2020/21" with the NHS logo. The background of the document shows a person in a clinical setting.
- X-ray:** A black and white X-ray image of a human hip joint.

List Planning

- Do not over fill
- Who is assisting?
 - Diary planning
 - Skill mix
- Speed
 - Bell shaped curve
- Other commitments
 - “Train to catch”
 - Compromise

Pre-Incision

WHO checklist – active listening

- Team Briefing / Safety Pause/ Time out
 - Team introductions
 - Empowerment
 - Is there a current G&S?
 - Any special equipment required
 - Anticipation
 - Significant blood loss expected?
 - Are there any critical steps?
 - Plans to deal with it

Tranexamic Acid

- Reduction in blood loss
- Reduction in transfusion
- Evidence
 - Trauma
 - Ortho
 - Cardiac
 - Obs – Woman trial
- Thrombotic risk
- Timing
 - ASAP
 - < 3 HRS

Cell salvage and tranexamic acid

- 1.1.5 Offer tranexamic acid to adults undergoing surgery who are expected to have at least moderate blood loss (greater than 500 ml).
- 1.1.6 Consider tranexamic acid for children undergoing surgery who are expected to have at least moderate blood loss (greater than 10% blood volume).
- 1.1.7 Do not routinely use cell salvage without tranexamic acid.
- 1.1.8 Consider intra-operative cell salvage with tranexamic acid for patients who are expected to lose a very high volume of blood (for example in cardiac and complex vascular surgery, major obstetric procedures, and pelvic reconstruction and scoliosis surgery).

Positioning

- Trendelenberg
- Deck Chair
- Montreal Mattress



Warming (WHO)

- $<35^{\circ}\text{C}$
 - Impaired enzyme function
 - Clotting Cascade
 - Platelet function
- Warm Air
- Warm fluids
- Drapes
 - Impermeable
- Intestines

Intra operative

- Minimising loss
- Dealing with bleeding

Intra-operative – “special measures”

- Tourniquet
 - Caution
- Local vasoconstrictors
 - Caution
- Permissive hypotension
 - Normalise
- Over-dilution
 - Avoid
- Laparoscopic
 - Increase pressure

Surgical Technique

- Most important
- Gentle tissue handling and dissection
 - Harmonic scalpel
 - Laser
 - Argon beam
- Avascular planes
 - Know anatomy

Technique

- View
- Light
- Coagulation
 - Blending
- Deal with bleeding as you come across it.
- Do not create a second problem.

Team

- High volume = lower losses
- Trust
 - Empowerment
 - All members
 - Dissolution
- Dialogue
 - Constant

Active Bleeding

- L
- A
- M
- P
- S

Active Bleeding

- Light
 - Adjust
 - Headlight
 - Retraction
- A
- M
- P
- S



Active Bleeding

- L
- Access
 - Wound
 - Port
 - Retraction
- M
- P
- S

Active Bleeding

- L
- A
- Manpower
 - Retraction
 - View
 - Experience
 - Empowerment
 - Dual Operating
- P
- S

Active Bleeding

- L
- A
- M
- Pressure
 - Whilst waiting
 - Buys time
 - Between stitches
 - May stop
- S

Active Bleeding

- L
- A
- M
- P
- Suction
 - Blind = dangerous

Active Bleeding

- L
 - A
 - M
 - P
 - S
-
- DeBakey forcep
 - Avoid teeth



Fairy dust, fluff & the last refuge
of the surgically destitute

Haemostasis

Topical Haemostat

Passive
"matrix"
Collagen
Cellulose
Gelatin

Surgicel
Gelfoam

Active
Thrombin

Floseal
Surgifoam

Haemostasis & Sealing

Fibrin Sealant

Evicel
Tisseal

Sealing

Sealant

PEG
Cyano-
acrylate

Coseal

Haemostasis

Topical Haemostat

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Tisseal

Sealing

Sealant

PEG
Cyano-
acrylate

Coseal

Tranexamic acid

- Topical
- 500mg / 5ml ampoule
 - Spray
 - Soaked gauze

Other

- DDAVP
 - Platelet dysfunction
- TEG / Rotem
 - Target deficiencies
 - Talk to haematologist early
- Vascular Ligation
- Embolisation
- Covered stent
- Hybrid theatre

Post op



“The Blood Bank is the surgeon’s
gas station.”

Anon U.S. 1960s