Role of (Interventional) Radiology in Abnormal Placentation

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abnormal placentation

- placenta praevia
- placenta accreta/percreta
- ectopic nb cervical
- retained POC, PPH, post hysterectomy haemorrhage
Diagnosis of placenta accreta

- 50-80% US Dx
- 88% sens 100% specif on MRI

Lam et al
Figure 17-7 Uteroplacental relationships found in abnormal placentation.
26 week ant placenta

normal
FS 34 week ant placenta
complete previa ?percreta
KM 31 week ant placenta
previa ??percreta
Placenta Accreta

- Chorionic villi attach to myometrium without decidua basalis
  - increta- invades myometrium
  - percreta-invasion to or beyond serosa (eg bladder)
- Main risk factor placenta praevia (10%, 40% if also 2 or more prior LSCS) also sub mucous fibroid, cornual implantation
- rising frequency
- main morbidity is blood loss at delivery- 3000-5500ml
Surgical vs Interventional

- Poor usage of interventional facilities by Obstetricians - reluctance to transfer out of theatre

- Recent articles re Internal iliac artery ligation and hysterectomy in Post partum haemorrhage - 25% failure rate leading to hysterectomy. Camuzcuoglu H et al J Obstet Research 2010

- Internal iliac artery ligation in hysterectomy for placenta accreta - no significant improvement in blood loss. Iwata A et al J Obstet Gynae research 2010


- 100% primary success of uterine artery embolisation in management of placenta accreta. Diop AN et al JVIR 2010S
Embolisation

- 1st line treatment
- occult GIT haemorrhage, uncontrolled epistaxis and haemoptysis
- unstable pelvic trauma
- spontaneous retroperitoneal haemorrhage

Pre-operative adjunct
- vascular head and neck tumours - glomus, JNA
- Vascular spine tumours
- Alternative to hysterectomy/myomectomy for uterine fibroids
Embolisation

- Embolic materials can be varied for desired level of blockage: coils - large, small PVA and liquids - small vessels
- Duration: gelfoam temporary, most others permanent
Reasons for under-utilisation

- moving a sick patient from theatre to radiology
- little tradition of co-operation b/w radiology and obstetrics, usually no MDT
moving a sick patient from theatre to radiology

avoid by performing high risk delivery in hybrid theatre with angio (not mobile II) Clark A et al Anaesthesia-analgesia 2013;1187-1189

design angio suites with anaesthetists so that anaesthetic staff comfortable in that environment
26yr old with placenta accreta involving bladder diagnosed in late mid trimester
recurrent bleeding with Hb of 8 g/100ml
Jehovah’s witness
What does interventional radiology have to offer?

- prevention of uncontrolled haemorrhage during delivery/uncontrolled placental separation - *temporary balloon occlusion* for haemorrhage control during urgent hysterectomy

- prevention of haemorrhage during hysterectomy - *pre-op embolisation*
Surgical Management of placenta accreta: a cohort series and suggested approach


- Antenatal Dx- US +/- MRI  26 cases . 8 treated by staged technique

- Pre delivery-
  - measure CIA- US
  - Bilateral placement of 7F sheath with identification of aortic bifurcation by guide wire and flash screening (5-10sec vs 2.9min fluoro for IIA) with measurement of distance from sheath to bifurcation
Delivery

prior to incision-placement of bilateral CIA balloons (4cm x 10mm) based on previous measurements, without fluoro

Classical caesarian delivery, attempting not to disturb placenta

If placenta separates or other severe haemorrhage then balloons are inflated and hysterectomy performed, infusion of heparinised saline through sheathes during surgery (suggest max balloon time of 30min before staged reperfusion)
Why common iliac balloons instead of internal iliac balloons?

- balloons can be placed without fluoro in theatre-
  vs 3-10min fluoro for IIA

- unlikely to be displaced once inflated

- in large vessels and unlikely to damage these.

- avoids problems of collaterals from profunda femoris
Post-delivery- if no sig haemorrhage

return to radiology for UAE

PVA , gelfoam and coils

Return to theatre

hysterectomy with clear visualisation for dissection in low pelvis
Results

26 cases-18 historical, 8 above protocol
Reduced blood loss-553 ml vs 4517ml
Reduced transfusion
  25% vs 89%
  0.5 vs 7.9 units
Reduced ICU and hospital stays- not sig
Prolonged anaesthetic- 6.6 vs 2.7 hrs
Cx- x1 vesico-vaginal fistula, x1 rpt laparotomy for haemorrhage, x1 pneumonia
No menopause
Embolisation

- Tool kit
  - preexisting bilateral sheathes
  - 5F diagnostic catheters- Cobra, Davis T
  - .021 Microcatheters-Renegade, Rebar etc
  - .018 fibre coils, gelfoam ‘bullets’, PVA
INTERNAL ILIAC ARTERY

ILIOLUMBAR
Passes laterally, behind obturator nerve & psoas. Lumbar branch to psoas, quadratus lumborum & spine. Iliac branch to iliacus, ilioischial bone, anastomosis at anterior superior iliac spine

LATERAL SACRAL
Passes inferiorly, lateral to anterior sacral foramina, anterior to roots to piriformis, spine (meninges, roots) & muscles on posterior sacrum

ARTERY TO VAS
Usually off superior vesical (or inferior vesical)

UTERINE ARTERY
In female it replaces inferior vesical (or middle rectal)
Mistakes/improvement

- Need long catheterisation if bladder involvement
- Have balloons in place during caesarian
  - measure and mark with steri-strip ‘flag’
- Take heparinised saline bag for flushing
- demand time for your set-up in theatre
Recent example

- JH 28yr G3P2 with x2 previous LSCS
- US diagnosis of placenta praevia +/- percreta
- US measure of CIAs
JH-day of delivery

- In radiology: placement of sheaths + measure to aortic bif’n + central venous access
- In theatre: placement of balloons through sheaths, delivery, closure of uterus and abdomen
- In radiology: embolisation of uterine and vesical arteries
- In theatre: hysterectomy with ease of dissection
JH-summary

- fluoroscopy over pregnancy- 14sec
- blood loss 200ml
- GA time about 6hrs
Other approaches

- **Balloons alone** - meta analysis JVIR 2018 Shahin Y and Pang CL
  - Internal iliac balloons - 1263ml
  - Aortic balloons - 890ml, large puncture size
  - Screening time - poorly reported
  - Prolonged balloon times - 40-60min, risk of vessel injury and lower limb ischaemia
- **Uterine preservation** - problems with delayed haemorrhage and infection
Thank You