Uterine artery embolisation to treat symptomatic myomas

Maritta Hippeläinen
Dept. of Gynaecology,
Kuopio University Hospital 9/03
**Uterine artery embolisation (UAE)/ Uterine fibroid embolisation (UFE)**

- **embolisation**
  - vascular occlusion using different kind of occlusion agents
- **embolisation in gynaecology 1979->**
  - first to control bleeding
    - postpartum
    - after surgery
- **to treat myomas 1993**
  - Ravina et al. Lancet 1995
Arterial embolisation to treat uterine myomata

Ravina et al. Lancet 1995;346:671-672

16 patients, aged 34-48 years

embolisation: 14 menorrhagia, 2 mass
  - 4 palliative (embolism, obesity, diabetes, AIDS)
  - 12 as alternative to surgery (10/93->)

results
  - symptoms resolved: n= 11 (+3 partial)
  - volume reduction 20-80%
  - myomectomy/ hysterectomy: n=2
    - (mean follow-up of 20 months (range 11-48)
Uterine artery embolisation
-description of the procedure

• performed by a radiologist
  – one of the femoral arteries is catheterised (1.7mm)

• local anesthesia
  – usually sedation with a narcotic and benzodiazepam

• pelvic angiography is performed to define the vascular tree
Uterine artery embolisation

- the uterine arteries are identified and catheterized
- arteriography is performed:
  - anomalies?
  - no other organs are affected
Uterine artery embolisation...

- Polyvinyl alcohol particles (PVA) are injected until there is complete bilateral vascular occlusion (permanent).
- Myomas: endarteries
  - Lack of blood and oxygen
    - -> shrinking
- Myometrium: good collaterals!
Uterine myomas: before and 18 h after embolisation (MRI)

Residual perfusion 3%
Good results

• > 90 % no technical problems
• 80- 95 % of cases satisfied
  – significant relief of menorrhagia
  – volume reduction 50%
    • 20-80% (6-9 months)
      – 2002 > 15 000 cases (estimated)
      – 1998: n=193
UAE: complications and special features good to know

• pain 100%
  – 6-12 h, intensity variable-why?

• angiography complications <1%
  – groin hematoma, allergic reactions
  – necrosis of other organs -theoretical

• post embolisation syndrome (PES)(15%)
  – fever, nausea, fatigue, leucosytosis
UAE, complications...

- infections (1-17%, PES?)
- expulsions of submucosal fibroids (5%)
- amenorrhea (1-2%, >45y, 5-10% >45y)
  - POF
  - endometrial effect?
- increasing number of case reports
  - sepsis, embolisation, necrosis of the uterine/ vaginal wall...
- severe complications rare
  - 3 fatal reported (mortality 0.2‰)

- 167/183 were embolized: bleeding disorders
- 163 bilaterally, 4 unilaterally
- no complications (pain!)
- after 6 months: 88% satisfied
  - The size of the uterus about 49% smaller
    - 3.5% hysterectomy (n=6, 1 for infection)
    - 5% passed submucous myomata
    - 2.3% POF (n=4)
- After 12 months n=46: the size of the uterus about 52% smaller
- why failure?
  - earlier pelvic surgery (adenomyosis?)
The Ontario uterine fibroid embolization trial *Fertil Steril* 2003

- multicenter prospective study (8 hospitals)
- n=538, UAE
- results 3 months:
  - median uterine/fibroid volume reduction 35/42%
  - significant improvement
    - dysmenorrhea 77%
    - menorrhagia 83%
    - urgency 86%
  - amenorrhea 3-7% <40y (40% > 50y)
  - 91% expressed satisfaction with UAE
UAE in Kuopio University Hospital (KUH) 3/2000->

- alternative to hysterectomy
  - n=20
  - no adnexal disease
  - no prolapse

prospective clinical trial
9/02->
- randomisation (n=100):
  - hysterectomy/embolisation
  - embolisation group (n=50)
Embolisation versus hysterectomy?
-which is best for women in Savo? 9/02->

- 53 patients with symptomatic myomata
- MRI
- embolisation randomised hysterectomy
- n=14 n= 22(100!) n= 17
- psychological (7) -wanted (11)
  operative risks (5) -contracept? (3)
- fear for oper. (2) -no MRI! (2)
- fear for oper. (2) -pain? (1)
- embolisation(12) operation(10)
- Follow-up 3years
- MRI 6 and 18 months
Characteristics of the women embolised in KUH, n=46

- mean age 50.3 years (range 40-63v)
- healthy 66.7%
- no pregnancies 29.4%
- HRT 41.7%
- anemia 37.5%
- mass, pelvic pressure 62.5%
About the fibroids embolised in KUH..

- submucosal 8.3%
- number of fibroids 1-> >10,
- > 3 fibroids in 47% of cases
- the biggest fibroid medium 7.3 cm
  - (3.4-11cm)
UAE: preliminary results in KUH

- 44/46 no technical problems (2 unilateral)
  - 1 small retroperitoneal hematoma
  - 3 small groin hematomas
  - 1 trombophlebitis because of contrast medium (MRI)
- pain
  - 100 % variable, 3 readmission to hospital
- no infections
  - postembolisation sdr (n=2)
UAE, Preliminary results (KUH)

- 44/46 of the women satisfied with the procedure
  - expulsions of myomas, n=3
    - 1 hysterectomy
    - 2 hysteroskopies
  - menorrhagia continues, n=3 (3 months after UAE)
- volume reduction of uterus/myomas variable
  - 20-80%, WHY?
One prospective randomized study: hysterectomy/embolisation (UEA)

- Pinto et al. Radiology 2003
- 64 candidates ---> 4 refused, 3 some contraindications
- 57 were randomized
- hysterectomy, n=19
- Information: UEA?, n=38
- -16 were operated, 37 were embolized
- 3 --------------> + 3
- + 1  <-------------- 1
- 4 were not succeeded (10%!)
- Emergency dept. visits
  - 20% (major complications) 32% (minor complications)
Uterine artery embolisation, benefits

- appears to be effective
- safe, low complication rate
- patient satisfaction high
  - easy
  - preservation of uterus
- economical
  - short hospital stay
  - KUH
    - UAE 1050 E
    - hysterectomy 2000E
**BUT...**

- Uterine artery embolisation
  - still experimental
  - no long term outcome results
  - causes of failure?
    - size/ location/ vasculature of the myomas?
  - recurrence of myomas?
  - HRT?
  - pregnancy?
- more controlled prospective studies needed!
A case report: uterine artery embolisation (KUH)

- 46 y woman, healthy
- no pregnancies, infertility problems earlier
- menorrhagia, urgency
- normal status 6 y earlier
- not willing to hysterectomy
- -MRI 14x10x12 cm uterus, several myomas
Embolisation of uterine arteries
Before and 6 months after embolisation: normal menstruation
UAE, still many questions?

49-year-old woman, size of dominant myoma 13 cm
49-year-old woman 18 h after embolization
Menorrhagia, several small myomas, one partly submucous (20%).
Before and 6 months after UAE
Hypermenorrhea has disappeared
When embolisation?

- So far, alternative to hysterectomy
  - pregnancy not desired
  - no contraception problems
- operation not a good choice
  - risks/ psychological reasons
- for first aid/ to make the operation easier (?)
- growth of fibroids with HRT (?)
Thank you
Key measures for embolisation (surgical precuderes)  
expert panel, JVIR 2000;11:509-515

- death
- reoperation
- operative injury
- menorrhagia
- premature menopause
- recurrence of myomata
- satisfaction
  - randomized trial, prospective registry, disease-specific quality-of-life instrument, and cost analysis
Costs, Kuopio University Hospital

- Embolisation  1050 Euros
  = hysteroskopic resection of myomas

- Hysterectomies  2000 Euros

- MRI  420 Euros (EVO)
  - not necessary
Society of Cardiovascular and Interventional Radiology (SCVIR)

• Kansallinen rekisteri, USA
• 4165 myoomien embolisaatiota (1999)
  – 25 gynekologista kirurgista toimenpidettä (?) vaativaa
    • 1:167
    • 6:1000
Tutkimuksen pääparametrit

- Embolisaation tekninen onnistuminen
- Hoidon komplikaatiot
- Kliininen tulos
  - Myomien /kohdun muutokset (MRI)
  - Oireiden lievittyminen/ tyytyväisyys
- Hoitoindikaatioiden selkiyttäminen
- UÄ/ MRI/ histologia
- Ennustetekijät
- Kustannukset
Satunnaistettu prospektiivinen vertailu-tutkimus myoomien embolisaatiohoidon ja kohdunpoiston välillä 9/02->

- kirjallisen suostumuksen antaneet peräkkäiset potilaat (n=100), joilla
  - hoitoa vaativat myoomat
  - indikaatiot kohdunpoistoon
  - dg varmistettu: MRI
  - ei jodivarjoaineyleherkkyyttä
  - ei operaatiota vaativaa laskeumaa (harvoin!)
How do we do it in Kuopio?

- Women come to the dept. of gynaecology the day before
  - antibiotic profylaxis,
  - pvk, CRP, Kreat
- UAE performed in the interventional radiology suite
  - 40-90 min
  - local anesthesia, Dormicum, diazepam iv
- observation in the postoperative dept. 4-6 h: PAIN?
- home the next day
  - antibiotics + PG-inhibitors 5-7d
  - sick leaves about one week