The use of uterine artery embolization for treating symptomatic uterine fibroids

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Background

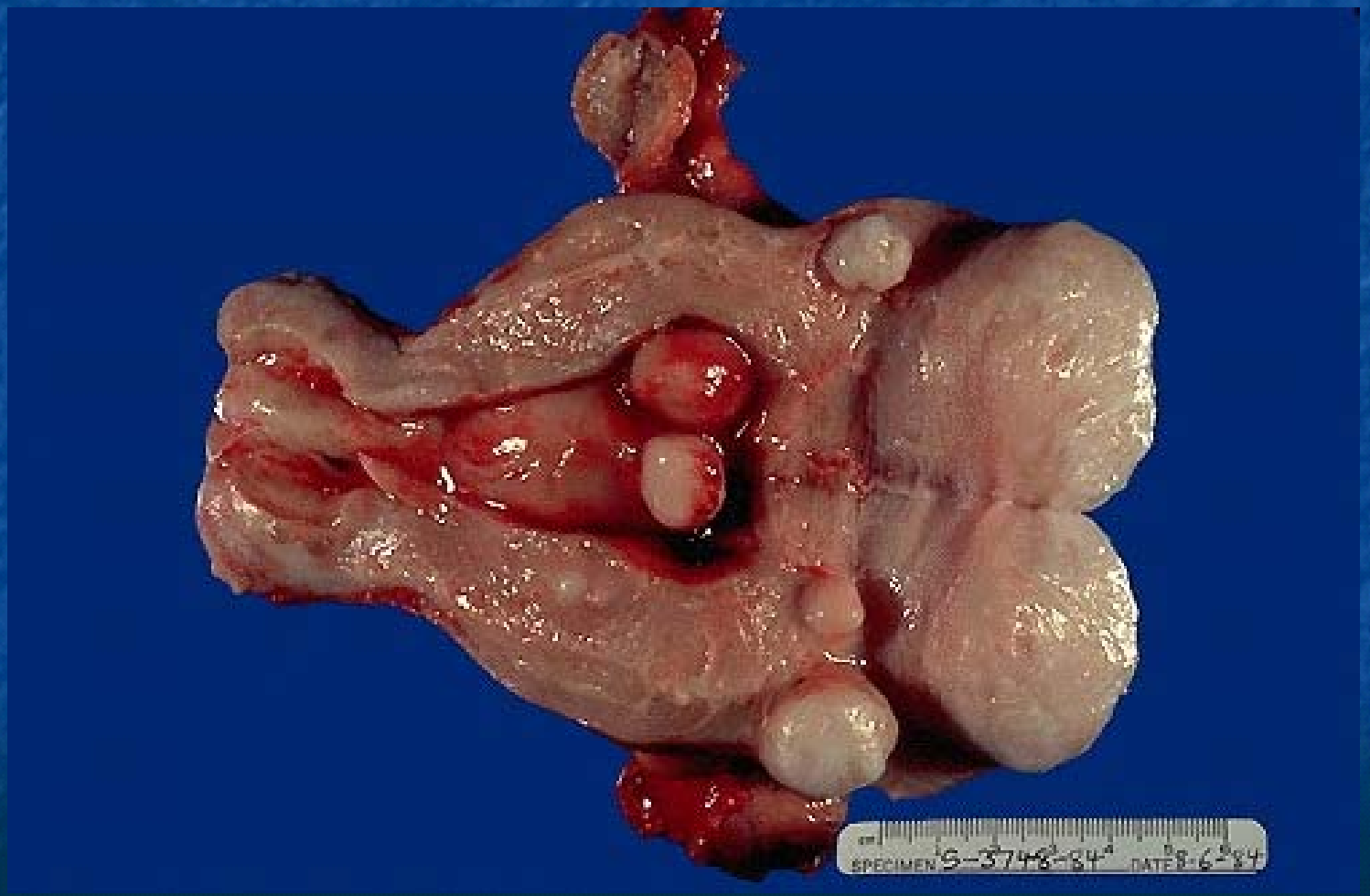
Uterine fibroids are the most common pelvic neoplasms in females

It is estimated that they are responsible for one third of gynecologic hospital admissions and account for more than 30% of all hysterectomies

Their prevalence is extremely variable, depending on the method used for diagnosis, ranging from 5.4% to 77%

Currently, the most effective method for treating uterine fibroids is surgery (either myomectomy or hysterectomy)

Different types of uterine fibroids *(pathological specimen)*

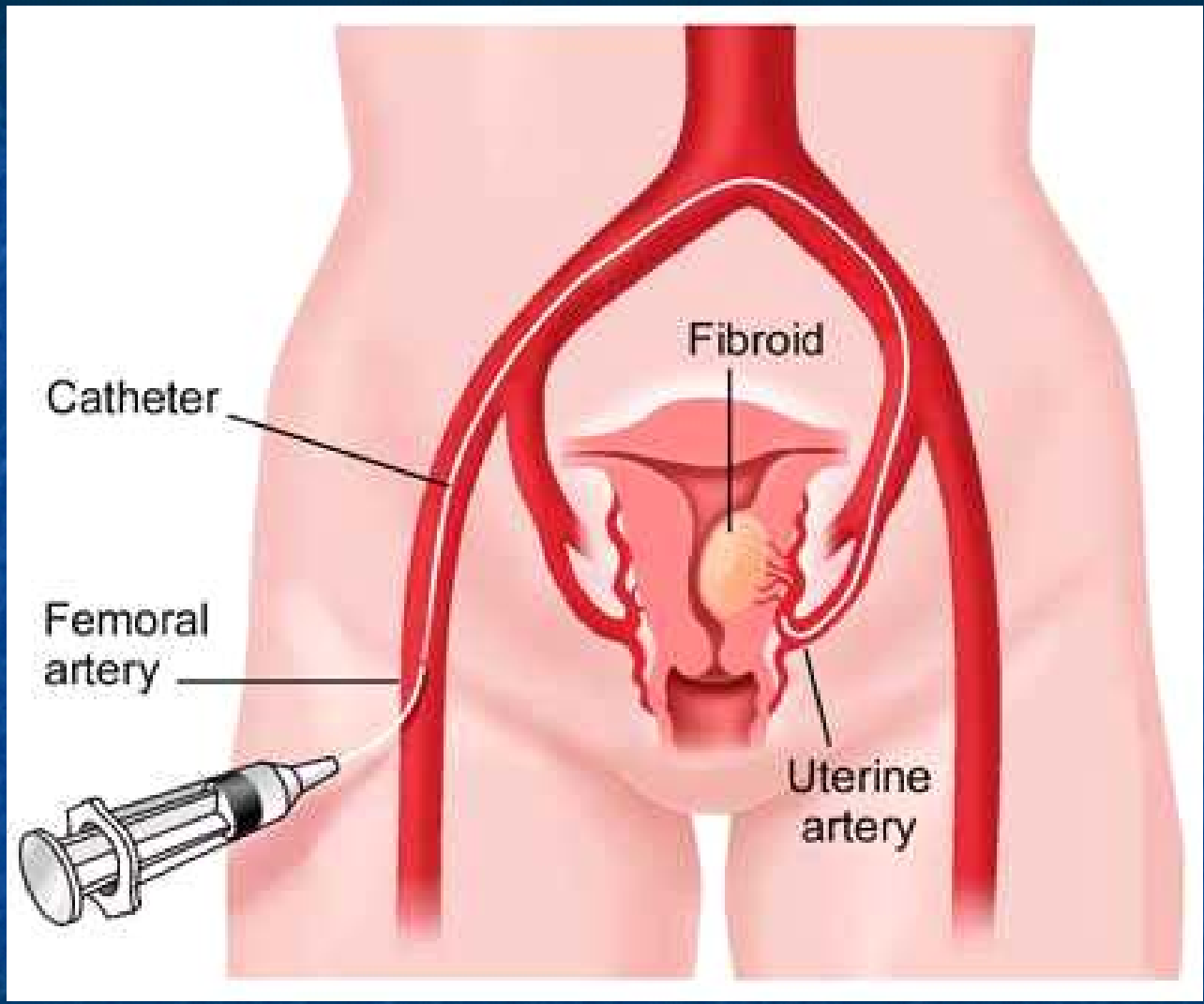


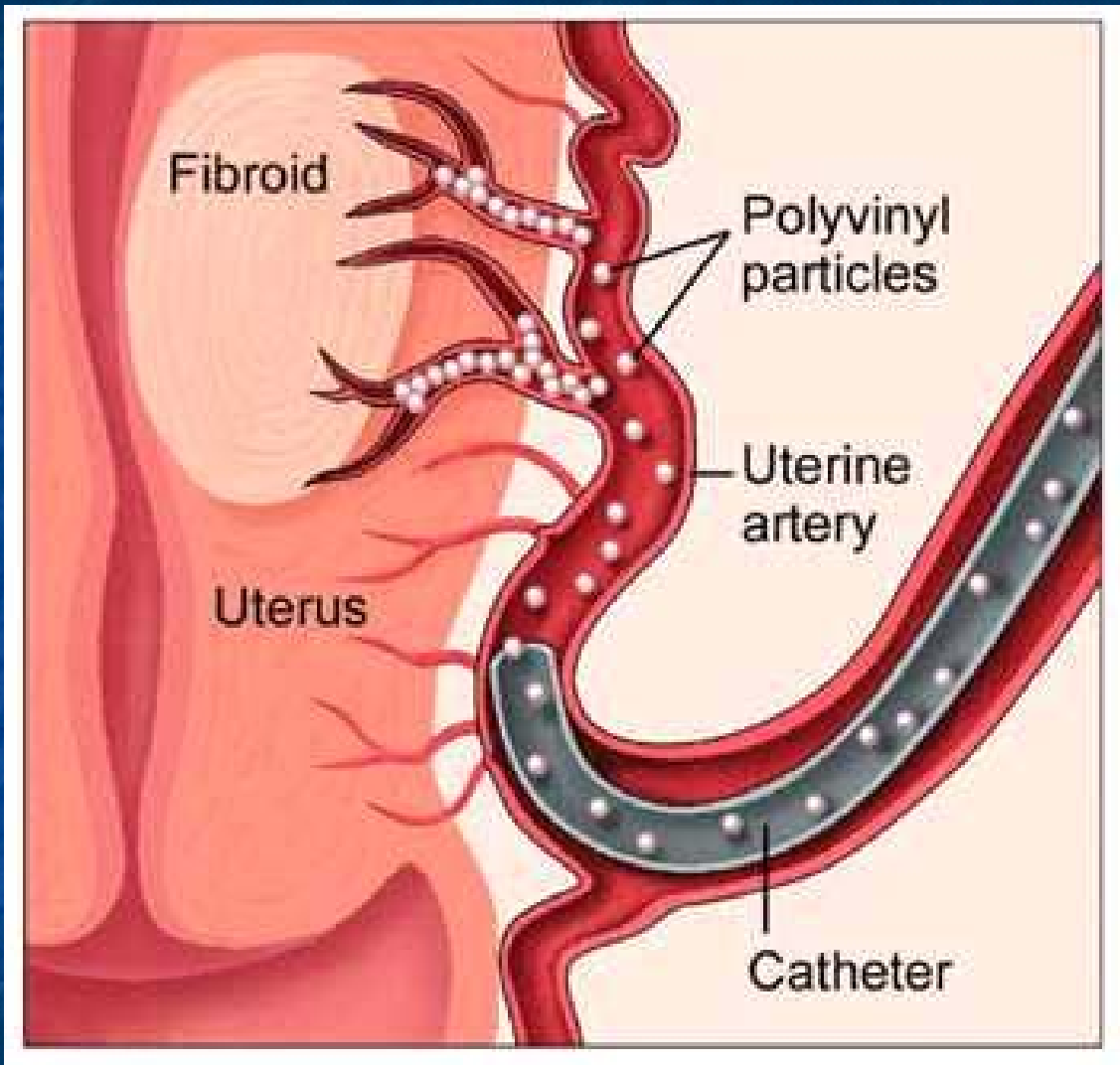
UTERINE ARTERY EMBOLIZATION (UAE)

- UAE was first reported in 1995 by Ravina and co-workers ***(Ravina et al., 1995)***

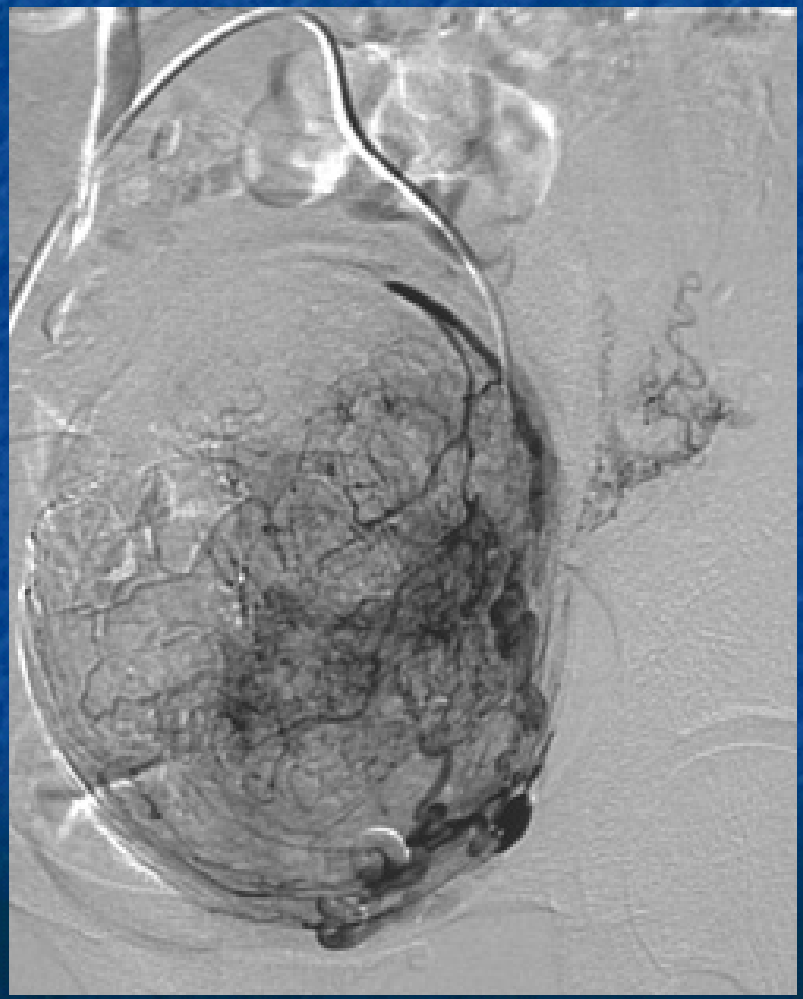
- It is a minimally invasive procedure that uses angiographic techniques and fluoroscopic guidance to embolize the uterine arteries

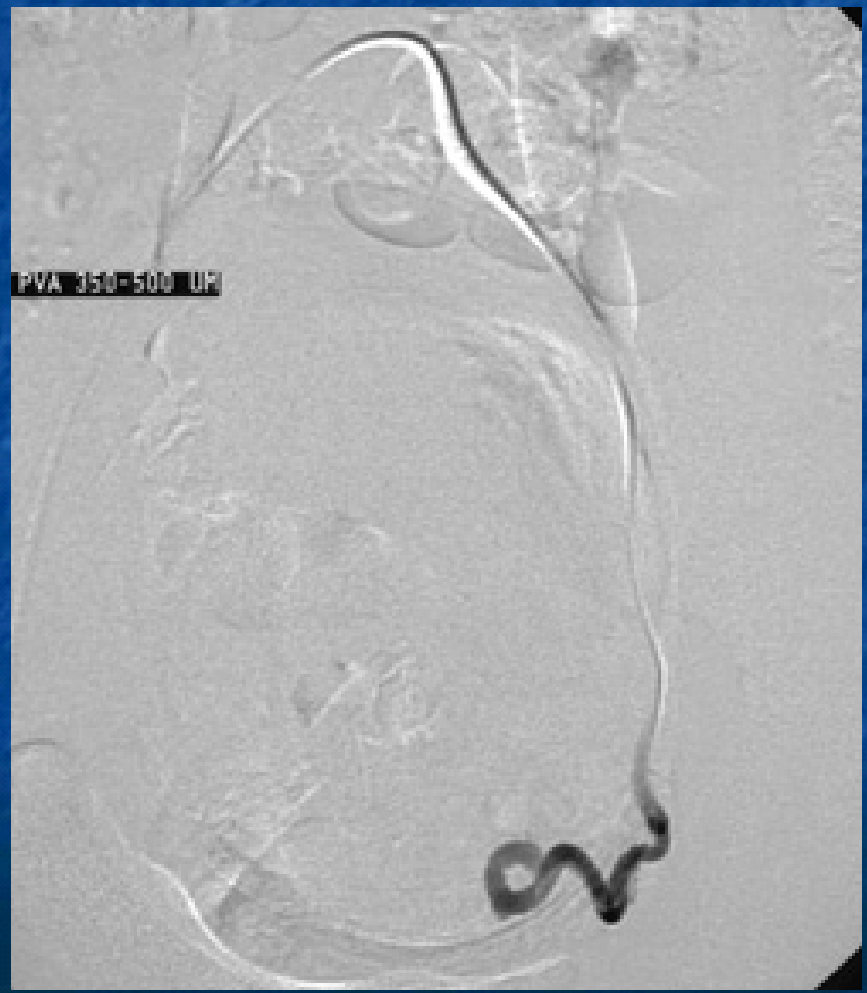
- Many embolic agents are employed in the process including Polyvinyl alcohol (PVA), Tris-acryl gelatin microspheres, Gelfoam (gelatin sponge)


Fibroid
Catheter
Femoral artery
Uterine artery


Fibroid
Polyvinyl particles
Uterine artery
Uterus
Catheter

Pre and post-embolization selective angiogram of the left uterine artery

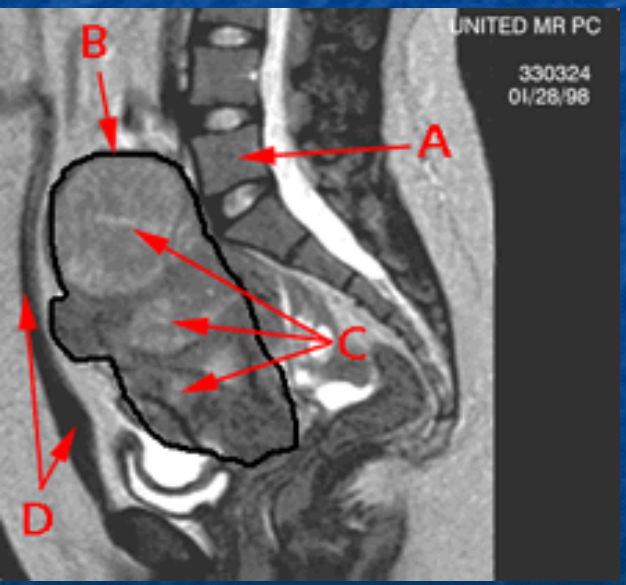


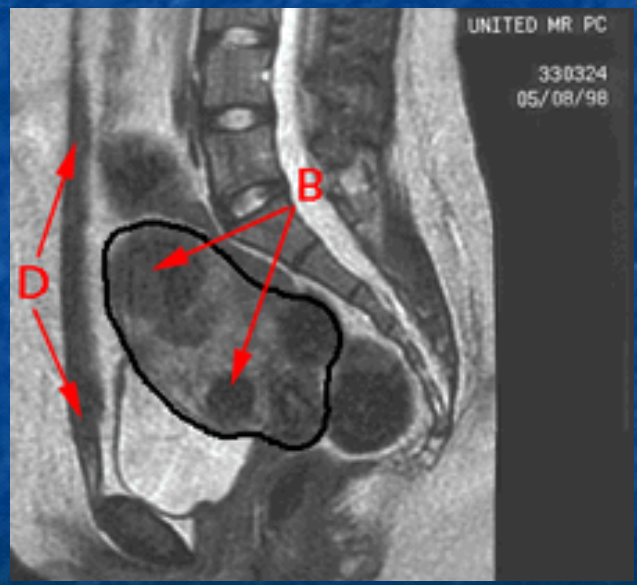


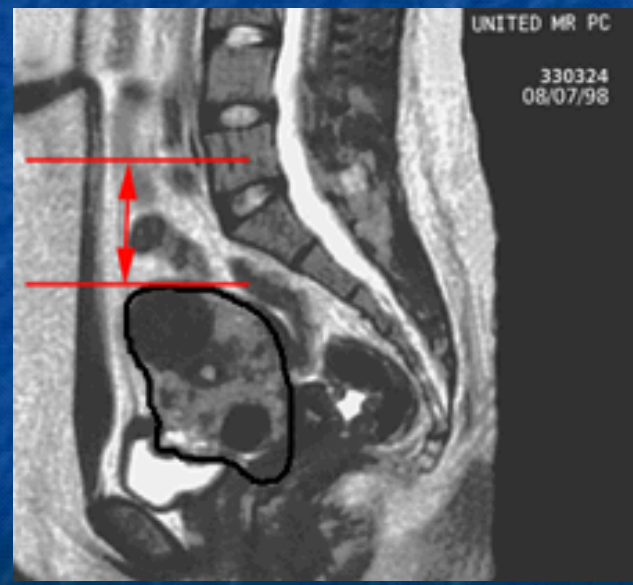
Pre and post-embolization nonselective pelvic angiogram

Clinical effects of UAE

Pre-embolization **After 14 weeks** **After 27 weeks**







Advantages

- Minimally invasive procedure
- Cheap
- Could be carried out on outpatient basis
- Shorter hospital stay
- Shorter recovery period
- No blood loss
- Potential preservation of fertility ?

Complications

- Failure of the procedure: 1-2%
- Post embolization syndrome: 2-7%
- Ischemic injury of the uterus: <1%
- Fibroid expulsion: 1-2%
- Severe infection: 0.6-1%
- Amenorrhea: 2-14% (Transient, Permanent)
- Allergic reactions
- Sexual dysfunction

A SYSTEMATIC REVIEW

Objectives

- Determine the efficacy and safety of UAE in relieving the symptoms of uterine fibroids as compared to alternative medical or surgical treatment
- Identify the adverse outcomes associated with UAE compared with other treatment modalities
- Design guidelines for management of uterine fibroids using Uterine Artery Embolization technique as regards: patient selection, type of embolizing substances, pre and post operative care and follow up plan

Methodology

- **Study design:**

Systematic review

- **Criteria for considering studies for this review:**

➢ *Type of studies*

✓ ***Inclusion criteria:***

➢ Preliminary search didn't reveal any randomized control trial

➢ Most of the published papers are case series

➢ All available case series studies conducted between 1995 -2005 were considered in this review

× ***Exclusion criteria:***

➢ Letters, editorials and rejected articles

➢ Type of intervention:

✓ Only studies aiming exclusively at using UAE for treatment of uterine fibroids

× Other studies that used UAE for other indications i.e. post partum hemorrhage, malignancy, etc.

➢ Type of outcome measures

Primary outcome: (crucial for selection)

- Symptomatic improvement
- Changes in the uterine and fibroid size
- Success rate

Secondary outcomes: (optional)

- Pregnancy related outcomes
- Improvement in the general condition (hemoglobin and haematocrit)
- Quality of life measures
- Adverse outcomes
- Need for additional treatment or surgical intervention
- Resource use

Search strategy for identification of studies

A search for publications in the literature that describes uterine artery embolization was done in the following data bases from 1995 to 2005:

- MEDLINE (PUBMED)
- EMBASE
- CINAHL
- HealthSTAR
- The Cochrane library
- NHS Centre for Reviews and Dissemination
- Centre for Evidence Based Medicine, Oxford
- Institute of Health Science Library, Oxford
- Database of Abstracts of Reviews of Effectiveness (DARE)
- Health Technology Assessment (HTA) Database
- National Research Register (NRR)
- Elsevier
- Scielo
- Blackwell-synergy
- CancerLit
- The search strategy used the following keywords or phrases: “uterine artery”, “fibroid”, “embolization”

Search results

- Preliminary search revealed about 470 studies addressing UAE
- Further study selection led to 41 case series which were deemed eligible for the review
- Only 20 case series were included in this review
- These series described the outcome of UAE in 2228 patients between 1995 and 2005.

SUMMARY OF THE REVIEWED STUDIES

n	Author/ year	Sample size	Follow up	Tech. Success
1	*Ravina et al. 1995*	16	48 mo.	14/16
2	*Bradley et al. 1998*	8	9 mo.	8/8
3	*Goodwin et al. 1997*	11	9 mo.	10 /11
4	*McLucas et al. 1998*	25	min 6 mo.	
5	*Worthington-Kirsch et al. 1998*	53	3 mo.	52/53
6	*Burn et al. 1999*	14	6 mo.	14/14
7	*Tranquart et al. 2002*	58	24 mo	58/58
8	Katsumori et al. 2002	60	12 mo.	59/60
9	*Pelage et al. 2000*	80	24 mo	76 /80
10	*Ravina et al. 1997*	88	6 mo	83/88

n	Author/ year	Sample size	follow up	Tech. Success
11	*Spies et al. 2001*	200	12 mo	198/200
12	*McLucas et al. 2002*	227	6 mo	220/227
13	*Hutchins et al. 1999*	305	12 mo	292/305
14	*Ravina et al., 1998*	184	30 mo.	176/184
15	*Walker & Pelage,2002*	400	24 mo	395/400
16	*Watson & Waker, 2002*	114	24 mo	114/114
17	*Chrisman et al., 2000*	66	76 wks	66/66
18	*McLucas & Parrella, 2001*	167	12 mo.	163/167
19	*Mohan et al, 2005*	20	56 wks	19/20
20	*Ravina et al, 2004*	454	9 mo	42/454

- Early results of uterine artery embolization (UAE) are encouraging, but still no long-term data exist
- Due to lack of RCTs, we cannot determine the superiority of the procedure to other management options
- UAE should be considered *ONLY* for women with symptomatic fibroids who might otherwise be advised surgical treatment

- The procedure is very effective in treating uterine fibroids:

➢ 85% to 96%* of UAE patients reported a reduction in bleeding

➢ 61% to 93%* have reported a reduction in bulk-related symptoms

➢ A reduction in fibroid size of 17% to 58%* has been reported

➢ Uterine volume decreased by 13% to 52%*

** Up to 12 months follow-up .*

- The procedure should be avoided in women who are unwilling to have a hysterectomy in any circumstances, as hysterectomy was performed in 1.6% to 4.5% of patients following UAE

- Infection is the predominant cause of serious morbidity and mortality. Further research on the place of prophylactic antibiotic therapy and the value of pre-treatment screening for infection is needed

- UAE as a treatment for fibroids in infertile patients should be within controlled clinical trials. Women should be aware that UAE may have a negative impact on their fertility

- There are insufficient data on the safety of pregnancy following UAE, although there are reports of successful pregnancies after UAE