

**Research Article****Uterine Artery Embolisation as Primary Therapy for the Treatment of Symptomatic Uterine Fibroids**Dr. Kailash Patel<sup>1\*</sup>, Dr. Pramod Sakhi<sup>1</sup>, Dr. Kaushalendra Soni<sup>1</sup>, Dr. Abhijeet Taori<sup>1</sup>, Dr. AartiKaul Patel<sup>2</sup><sup>1</sup>Department of Radiodiagnosis, Sri Aurobindo Medical College and P.G. Institute, Indore, India<sup>2</sup>Department of Radiation Oncology, Sri Aurobindo Medical College and P.G. Institute, Indore, India**\*Corresponding author**

Dr. Kailash Patel

Email: [dr\\_kpatel@yahoo.com](mailto:dr_kpatel@yahoo.com)

**Abstract:** The aim of the presented study was to evaluate the efficacy of Uterine Artery Embolisation(UAE) as primary therapy in treating symptomatic uterine fibroids. We treated 80 patients in the age group of 19 to 45 year with symptoms of menorrhagia, dysmenorrhea, dyspareunia and pressure symptoms i.e., frequent urination, constipation, pelvic pain by UAE over period of 3 years. Bilateral uterine arteries were embolised in all patients from single groin approach using 5 Fr slip catheter RUC catheter (Robertson uterine artery catheter). Follow up ultrasound was done to assess the decrease in size of fibroid and uterus at 3, 6, 9 and 12 months interval. Better Health Related Quality of Life(HRQOL) was observed in 95% of patients. Bulk related symptoms showed improvements in 92.5 % patient at 12 months. Fibroid volume was reduced around 40% in 3 month, 60% in 6 month & 72% at one year follow up in 95% patients. Average uterine volume reduction was 30% at 3 month and around 46% at 12 month follow up. In conclusion UAE is a reasonable option for women, who wish to preserve their uterus, avoid surgery and prolonged recovery period. UAE has low complication rate, high clinical outcome and high patient satisfaction rates.

**Keywords:** UAE (Uterine Artery Embolisation), HRQOL (Health Related Quality of Life), PVA (Poly-vinyl alcohol), Menorrhagia, Fibroids, Leiomyomas.

**INTRODUCTION**

Uterine artery embolisation as an adjunct to surgery in the treatment of fibroids was described by Ravina et al in 1994 and a year later as a primary therapy [1]. Trans-catheter uterine artery embolisation (UAE) is a promising, exciting, minimally invasive alternative to conventional treatment of symptomatic uterine fibroids [2]. Current data indicates that success rate of UAE is comparable to standard uterine-spacing surgical therapy [3].

Uterine leiomyomas (fibroids) are the most common gynecological tumors in women, occurring in 20% to 25% of women of childbearing age. Although asymptomatic in the majority of women, fibroids are a common cause of heavy prolonged menstrual bleeding (menorrhagia), intermenstrual bleeding (menometrorrhagia), urinary frequency, stress incontinence, and pelvic pain in approximately 25% of women with fibroids. Although patients may experience these symptoms during their 20s, women usually do not manifest severe symptoms until their late 30s or 40s.

Trans-catheter uterine artery embolisation (UAE) is a rapidly emerging alternative to conventional medical and surgical therapy in the treatment of symptomatic uterine fibroids. The technique of pelvic vessel embolisation is well recognized as an effective treatment for acute pelvic hemorrhage postpartum hemorrhage, trauma, postsurgical uterine bleeding,

ectopic pregnancy, placenta accreta, cervical pregnancy, and vascular malformation.

**METHODOLOGY**

After taking approval from our institutional review board, we started our study from Sept. 2010 till Aug 2012 with total time period of 3 years. All women with symptomatic uterine fibroids suffering from symptoms like menorrhagia, dysmenorrhea, dyspareunia and pressure symptoms i.e., frequent urination, constipation, pelvic pains were taken for UAE.

Exclusion criteria were women with desire to become pregnant, possibility of tumor to be malignant, severe pelvic infection and pedunculated fibroids.

Each patient underwent pelvic USG on iU22 Philips ultrasound machine before UAE to know the size, site, vascularity and volume of the fibroids, dominant fibroids, number of the fibroids, uterine volume and possibility of any other co-existent pathology. MRI was done in selected patient to differentiate adenomyosis from uterine myoma seedlings.

**Uterine Artery Embolisation Procedure****Pre procedure workup**

All patients underwent routine hematological, renal, coagulation profile, HIV & Hbs Ag, before procedure and prophylactic antibiotics were given on

the day of procedure (InjCefotaxime 1 gram I/V 12 hrly till 5 days after the procedure).

Detailed informed consent was taken from each patient before procedure and UAE was performed in Interventional Radiology suite on Philips Cath lab equipped with DSA. Local and I/V conscious sedation is given for making the patient comfortable.

**Procedure**

UAE was performed in all patients preferably from right femoral puncture approach. Robertson uterine artery (RUC) 5 Fr slip catheter (Cook medical system) was used in majority of the patients while in 3 patients Co-axial micro-catheter (Progreat from Terumo) was used to selective cannulate the uterine artery.

Initially to assess the blood supply of uterus, Aortogram was done and then selective cannulation of uterine artery was done using 5 Fr slip Catheter Robertson uterine artery catheter. After advancing the catheter in horizontal segment of uterine artery beyond cervical artery, embolisation was done using poly vinyl alcohol (PVA particle 500-700 micron) from Cook

Medical. The PVA particles were mixed with diluted contrast for injection. Factors indicative of end point of embolisation were cessation of forward blood flow and stasis of contrast in branch vessel of uterine artery.

Bilateral uterine arteries were embolised in all patients from single groin approach. Patients were shifted to ward for observation next 24 hours. Post fibroid embolisation events were pain, often severe for almost 6-24 hours with mild pyrexia and vomiting. These symptoms were dealt with analgesic cocktail and antiemetic drugs.

Immediate post procedure USG was done of all patients on next day to assess the proper embolisation. Embolised fibroids were showing typical starry sky appearance on ultrasound. Follow up ultrasound was done to assess the decrease in size of fibroid and uterus at 3, 6, 9 and 12 months interval.

**RESULTS**

We treated 80 patients (Age Group – 19-45 of symptomatic uterine fibroids by UAE) from Sept 2010 till August 2012.

**Table 1: Types of Dominant Leiomyoma in patients (n=80)**

Type	Percentage
Submucous	10 (12.5%)
Intramural	62 (77.5%)
Subserosal	8 (10%)

**Table 2: Mean volume of uterus and dominant leiomyoma**

Mean volume of uterus and dominant leiomyoma	
Mean uterine volume.	620 cc
Mean dominant leiomyoma volume	320 cc

**Table 3: Patients distribution on basis of their symptoms (n=80)**

Symptoms	Patients %
Menorrhagia	72 patients (90%)
Pressure symptoms	32 patients (40%)
Pelvic pain	62 patients (77.5%)
Urinary symptoms	19 patients (23.75%)

Bilateral uterine arteries were embolised in all 80 patients with single groin approach (100% technical success). Catheter used to cannulate uterine artery is RUC slip cath from cook (96.25%), where as three patients required co-axial 2.7 Fr Progreat micro catheter (3.75%).

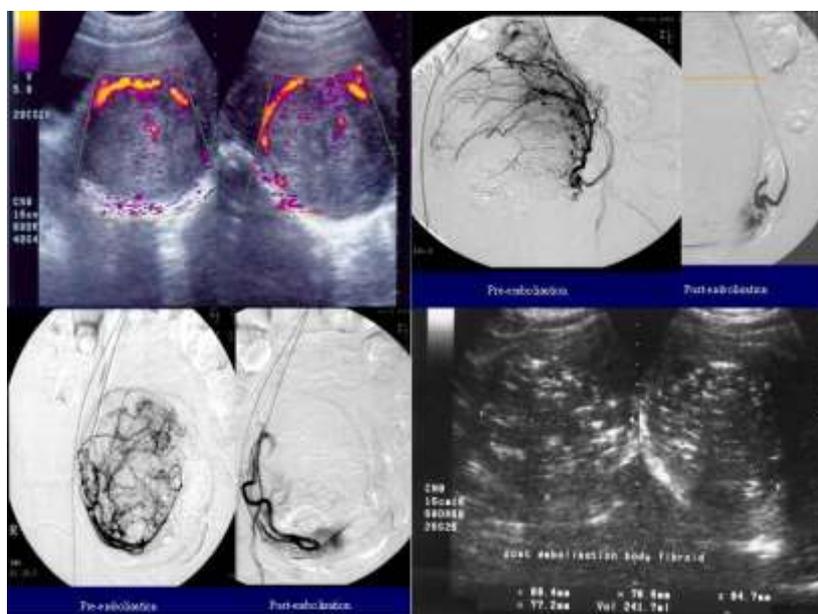
Follow up of patients satisfaction was obtained by Questionnaire & interview at 3, 6, 9 months & at 1 yr.

**Table 4: Relief in Symptoms**

Menstrual bleeding: - Menorrhagia improved in 86.25 % - patients at 3 month & in 95% patients at 12 month.  
 Bulk related symptoms, pelvic pain improved in 65 % at 3 months & 92.5 % patients at 12 months  
 Overall satisfaction & better quality of life after UAE in 95% patients at 1 yrs. follow up  
 Fibroid volume was reduced around 40% in 3 month, 60% in 6 month & 72% at one year follow up in 95% patients.  
 Average uterine volume reduction was 30% at 3 month and around 46% at 12 month follow up.

**Table 5: Periprocedure Complication**

One patient showed no significant reduction in the volume of fibroid due to dominant ovarian artery supplying the fibroid (1.25%).  
 Three patients had spontaneous passage of fibroid p/v (3.75%) out of this One patient required P/V delivery of fibroid by gynecologist, 7 days after the procedure (1.25%).  
 Two patients showed TIA like symptoms, mood disturbance (2.5%) but recovered in 2 weeks time with symptomatic treatment.  
 One patient showed partial response in term of 1.25% volume reduction of fibroid.  
 No severe morbidity / mortality in any of the case.



**Fig 1: Pre embolisation Doppler showing perifibroid plexus, Fig 2: Selective left uterine pre and post embolisation, Fig3: Selective right uterine pre and post embolisation, Fig 4: Post embolisation starry sky appearance on USG.**

**DISCUSSION**

We evaluated the efficacy & safety of UAE as a primary therapy for treating symptomatic uterine fibroids first reported by Ravina [1]. PVA particles used as the embolic agent, injected through the catheter placed selectively in uterine arteries. We used PVA particle of size 500-700 micron as embolic agent with mean follow up of 12 months.

In our series both uterine arteries were embolised in all 80 patients with 100% technical success by single groin approach. Primary outcome of our study was (HRQOL) after UAE, which was much better following UAE after 1 year in 95% of patients.

In our series 95% patients reported improvement or elimination of fibroid related

symptoms on 12 months follow up. Menorrhagia was improved in 86.25 % at 3 month & in 95% at 12 months. These results are quite similar to studies published earlier by James B. Spies [4] & review of literature by J. B. Spies Sept-2001[5].

Goodwin *et al.* - UCLA reported on the result of this treatment in 11 patients [6], our embolisation technique was similar to Ravina but we used bigger size particle (500 to 700 micron meter) similar to Goodwin *et al.* [6]. Ravina's group later reported larger group study-February – 1997- [7] with similar results.

Bulk related pressure symptoms improved in 65% patients at 3 month & 92.5 % at 12 month follow up, which is mirror results of previous publications [1,6-10].

Mean reduction of fibroid volume was 40% at 3 month & 72% at 1 yrs follow up & uterine volume reduction was 30% at 3 month & 46% at 12 months follow up - quite similar to results of Worthington - Kirsch [11].

In our series there is one failure in regards to fibroid volume reduction & good control of menorrhagia due to dominant ovarian artery. One patient reported recurrence of symptoms in terms of pelvic pain & recurrence of fibroids (4-5 in no) at 2 yrs. follow up after the procedure, underwent myomectomy lateron (1.25%).

Our three patients reported intermittent P/V non purulent discharge followed by expulsion of sub mucosal fibroid per vaginally 2-4 weeks after the procedure, out of which one required hysteroscopy assisted delivery of fibroid by surgery, which has also been reported in previous publication by Bradley E, Reidy [8] and a brief report from Melbourne [9] & Anderson's group [12].

Our two patients got premature amenorrhea after UAE (2.5%), which is a known consequence after UAE (4,13,14,15,16). In our series median follow up was 12 months and patient had improved bleeding P/V in 95% at 12 month & dominant fibroid volume reduction is 72% at 12 months followup [17].

One patient in our series had large single vascular fibroid (750 cc) occupying almost entire uterus which was regressed to 10 cc after 3 months & 12 months later she conceived & delivered a healthy baby of 34 weeks gestation, which has been reported by pelage *et al* earlier [15]. Our one patient did not improve adequately in terms of control of menorrhagia & fibroid volume reduction, due to associated adenomyosis, which was also reported by Smith *et al* [18].

In our series no sepsis or post procedure infection developed [16] presumably because of good antibiotic coverage from the day of procedure till 5 days after the procedure [16]. No severe morbidity or mortality in any of our cases. None of our patient required secondary hysterectomy.

It appears from our result and initial experience that UAE controls both menorrhagia & bulk related symptoms in 90-95% of patients. There is good reduction in the volume of fibroids and uterus after UAE. Post procedure recovery time after UAE is much shorter. There is no significant morbidity or mortality associated with UAE. Pregnancies after UAE have been reported but pregnancy rate is not known. Our results and results of published series & those presented at scientific meetings are quite similar.

## CONCLUSION

Uterine artery embolisation is a safe, minimally invasive technique which provides excellent symptomatic relief in patients with fibroids. UAE is a reasonable option for women who wish to preserve their uterus, avoid surgery and prolonged recovery period.

UAE has low complication rate, high clinical outcome and high patient satisfaction rates.

Uterine artery embolisation shall be considered as an adorable alternative to hysterectomy / myomectomy.

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