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# Uterine Artery Embolisation (UAE) for Treatment of Myomas

## Results of the 4th Radiology-Gynaecology Experts Meeting

### Uterusarterienembolisation (UAE) zur Myombehandlung

Ergebnisse des 4. radiologisch-gynäkologischen Expertentreffens

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#### Bibliography

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#### Preamble

Uterine artery embolisation (UAE) is an organ-conserving, established, safe and effective procedure in the physician's toolbox for treating complaints due to myoma.

The aim of UAE is rather to reduce or eliminate complaints due to a myoma and not to remove the myoma. At the same time a reduction of the size of the myoma can be achieved.

There is agreement between the specialties gynaecology and interventional radiology that an indication for the required therapy in cases of uterus myomatosis is only given after expert examination by and consultation with a gynaecologist. A complete and comprehensive consultation on treatment options for symptomatic uterus myomatosis explicitly includes, besides the drug and surgical treatment options, also UAE. The decision for or against a therapeutic option should be made in consideration of the individual patient's wishes and with a full knowledge of other strategies, their chances of success, their limitations as well as their typical side effects and possible complications (informed consent).

In Germany, Austria and Switzerland, uterine artery embolisation provides a treatment option for complaints due to myomas that enables a further individualisation of the therapy for uterus myomatosis.

#### Aim of the Consensus Meeting

The intention of the consensus meeting was to make an up-to-date evaluation of UAE. The participants of the radiology-gynaecology expert meeting have, on the basis of a renewed assessment of the available literature, published international guidelines as well as their own experience and extensive discussions, reached a consensus between the two involved specialties. The

group of experts was fully aware that the possibilities and limitations of a radiological therapy option would have to be discussed with experts from the field of gynaecology who do not perform such procedures themselves but who have extensive experience in the diagnosis and treatment of diseases of the female genital organs.

The expert group comprising 14 radiologists and 8 gynaecologists that came together on January 19, 2013 in Berlin for the 4th radiology-gynaecology consensus also included radiologists and gynaecologists from Switzerland and Austria. After extensive and, in part, controversial discussion the group formulated in consensus the following recommendations. The consensus paper was supported by the gynaecologists and radiologists listed at the end of the present contribution. This paper reflects the current state of knowledge.

#### Structural Prerequisites and Quality Assurance in the Performance of UAE

UAE should only be carried out in hospitals in which specialists in the fields of gynaecology and radiology are present who have the necessary experience in its performance, where an adequate and structured pain therapy after the operation and expertise in the management of side effects as well as of conservative and surgical therapy for myoma are available.

In particular, due to the postoperative necessity for pain therapy UAE should only be performed in hospitals on an inpatient basis.

Prior to introduction of UAE in a hospital, theoretical and practical training in a centre with extensive experience in the performance of UAE as well as participation in courses on the theory and practice of UAE are strongly recommended. Beside the legally required documentation, for quality assurance the determined characteristic numbers for radiation exposure (dose area product,

exposure time) should also be checked every three months under consideration of the average values given for UAE in the literature.

Participation in a suitable quality assurance programme of the professional societies is also recommended.

### Examinations Necessary Prior to UAE

Fundamental for therapeutic decision making is a gynaecological examination including vaginal and/or abdominal ultrasound (depending on the size of the uterus myomatosus) by a specialist. If the ultrasound diagnostics do not provide an unambiguous result then there is a generous indication for an MRI study.

Prior to the embolisation of any myoma, the indications for hysteroscopy and fractionated abrasion should be checked. Also in the past year at the most there should have been an unremarkable cytological smear test of the cervix uteri.

Besides a test for pregnancy, the following laboratory results must be available: creatinine, coagulation status, thyroid values (in cases with positive thyroid history), blood count and CRP. An active inflammation must be excluded by case history and clinically.

### Indications for UAE

Indication for a uterine artery embolisation is a symptomatic uterus myomatosus. UAE represents an alternative to surgical and drug procedures as well as to myoma treatment with focussed ultrasound that is independent of the size and number of myomas or previous operations. Foundations for the therapeutic decision making are the objective of the treatment and the individual patient's wishes.

### Criteria for Success of UAE

The main issues for therapeutic success after UAE are an improvement or complete elimination of the complaints (due to myoma) stated by the patient and to a lesser extent a reduction in volume of the dominating myoma or, respectively, the entire uterus after the treatment.

### Contraindications for UAE

#### Technical

#### Relative

- ▶ Prior treatment with GnRH analogues in the preceding 3 months (increased risk of vasospasm of the uterine artery)

#### Anatomic

#### Relative

- ▶ Isolated, submucosal myomas of types 0 and I according to ESGE, that are suitable for hysteroscopic removal
- ▶ Isolated subserosal pedunculated myomas
- ▶ (Co-)supply of the myoma(s) via an ovarian artery; here the benefits and risks of an additive embolisation of the respective ovarian artery must be considered

### Clinical

#### Absolute

- ▶ Suspicion of malignancy
- ▶ Pregnancy
- ▶ Acute genital infection
- ▶ Manifest hyperthyroidism/active thyroiditis with hyperthyroid metabolic condition as well as planned or on-going radioiodine therapy, or when iodine-containing contrast media are being used

#### Relative

- ▶ Documented allergic reaction to iodine-containing contrast media
- ▶ Postmenopausal patients
- ▶ Allergic to local anaesthetics
- ▶ Latent hyperthyroidism
- ▶ Renal insufficiency (creatinine value > 1.5)
- ▶ Indwelling IUD
- ▶ Family planning not yet completed
- ▶ Immunosuppression

### UAE in Patients with a Desire to Have Children

When the wish to have children is not yet fulfilled UAE must be considered as a last resort treatment. Possible risks include above all a potential reduction of the ovarian reserves, an increased risk of abortions, placentation disorders and heavier postnatal bleeding.

For patients with an unfulfilled desire for children and a symptomatic uterus myomatosus, the role of UAE as treatment option has not been sufficiently clarified in the available literature.

Before hysterectomy is considered for a patient with fulfilled family planning and a pronounced uterus myomatosus the possibility of a UAE should be taken into account.

### The Special Case of Preoperative Myoma Embolisation (PUAE)

PUAE, i.e., embolisation as a direct preparation for surgical myoma enucleation, can be considered and offered to individual patients who have a strong wish to retain their uterus and for whom even preoperatively an elevated bleeding risk can be assumed and/or for whom the risk of an eventually necessary hysterectomy is considered to be high for "technical reasons" (e.g., very large myoma and/or multiple myomas, myomas that would be difficult to remove and myomas in unfavourable positions).

### Radiation Protection

Radiation protection in UAE is especially important. If at all possible pulsed fluoroscopy should be employed. Serial angiographies and oblique projections should be reduced to a minimum. As a rule an acquisition frequency of 1 image/s is sufficient. The average value for the dose area product under normal conditions should be less than 50 Gy × cm<sup>2</sup> for pulsed systems. The average exposure time for UAE should amount to less than 20 min. The exposure to radiation here corresponds to that of about 2 to 3 CT scans of the abdomen.

## Side Effects (Table 1)

Uterine discharges in the first weeks after UAE can be normal. In the case of conspicuous vaginal discharges diagnosis of and therapy for infections should be carried out. Menorrhagias, cramping pain in the lower abdomen or discharge of tissue particles can occur, especially with submucosally displaced myomas. Depending on the clinical symptomatics and the findings of imaging diagnostics a hysteroscopic myoma resection or a vaginal myoma ablation as for a myoma in statu nascendi may be indicated. Hysterectomy is a priori not indicated. In cases of doubt the centre that performed the UAE should be consulted.

## Follow-Up Examination after UAE

A follow-up examination by a specialist is recommended at about 6 months after UAE. Imaging procedures (e.g., ultrasound in combination with Doppler ultrasound, MRI) are helpful. In the absence of therapeutic success (no improvement of symptoms and/or growth progression of the myoma) or conspicuous imaging findings (increase in size of the myoma[s] or uterus and/or lack of devascularisation of the myoma[s]) further clarification is necessary.

## Perspectives

It is planned in 2015 under consideration of the data that will then be available and the gained experience to again reconsider and revise these recommendations on uterine artery embolisation for complaints caused by myomas.

## Participants of the Consensus Meeting

PD Dr. med. Ralf Adamus/Nürnberg  
Dr. med. Michael Bartsch/Hamburg  
Dr. med. Tobias Belting/München  
Prof. Dr. med. Christoph A. Binkert/Winterthur (CH)  
Dr. Andreas Hatopp/Stuttgart  
Dr. med. Thomas Hess/Winterthur (CH)  
Prof. Dr. med. Augustinus L. Jakob/Zürich (CH)  
Dr. med. Elke Krystek/Heidelberg  
PD Dr. med. Peter Landwehr/Hannover  
PD Dr. med. Boris Radeleff/Heidelberg

**Table 1** Relevant side effects and complications of UAE (in %) (sources: [1, 2]).

Amenorrhoea	3.9–4.3
Pain	3.6
Discharge	3.4
Angiography-related complications (e.g., inguinal haematoma)	2.9
Vaginal outflow of myoma material	1.5–4.7
Hot flushes	1.4
Endometritis/myometritis	1.4
Postembolisation syndrome	0.2–2.9
Deep vein thrombosis/pulmonary embolus	0.2

Dr. med. Göntje Peters/Kiel  
Prof. Dr. med. Thomas Pfammatter/Zürich (CH)  
Prof. Dr. Dr. Thomas Rabe/Heidelberg  
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Prof. Dr. med. Dierk Vorwerk/Ingolstadt  
Prim. PD Dr. Peter Waldenberger/Linz (AT)

## Participating Professional Societies and Working Committees

AGE, Arbeitsgemeinschaft Gynäkologische Endoskopie  
DeGIR, Deutsche Gesellschaft für Interventionelle Radiologie  
DGGEF, Arbeitsgemeinschaft Gynäkologische Endokrinologie und Fortpflanzungsmedizin e.V.  
DGGG, Deutsche Gesellschaft für Gynäkologie und Geburtshilfe  
DRG, Deutsche Röntgengesellschaft  
ÖGIR, Österreichische Gesellschaft für Interventionelle Radiologie  
SSCVIR, Swiss Society of Cardiovascular and Interventional Radiology

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