

## Fibroids and Fertility

### Do all fibroids impact upon fertility?

The short answer is no. Fibroids are estimated to account for, or contribute to around 1-2% of infertility. Fibroids that distort the lining of the uterus (endometrium) affect fertility by means that are at present, incompletely understood. Possibilities include:

- The endometrial vascularity over the fibroid may be altered, reducing fertility and
- There may be differences in the biochemical milieu and contractility of the uterus at the site of the fibroid.

Importantly, the location of the fibroid and not its absolute size is the key factor in whether or not it may affect fertility. Even very small fibroids, when distorting the endometrial cavity, may impact on fertility whereas large fibroids on the outside of the uterus may not. The issue of fibroids within the uterine musculature (intramural) is more difficult. At present, it is thought that intramural fibroids, of 4cm or more do affect fertility, but removing these fibroids may not necessarily restore spontaneous fertility rates to normal. Note that this is different in the case of IVF.

*I strongly suspect that although removing these fibroids results in a fertility gain, some of that gain is negated with resultant adhesions.* Thus the onus is on the gynecologist to remove the fibroid, returning the uterus in as perfect a fashion as possible, restoring myometrial continuity, with little chance of infection, hematoma or subsequent adhesion formation. This requires a meticulous surgical technique and I believe anti-adhesive measures to play a role. Please see **Laparoscopic Removal of Fibroids** for further discussion.

## Do all fibroids interfere with a pregnancy?

Once again, the answer is no. Everything depends on the site and size of the fibroid. Interestingly if in comparing groups of women with and without submucosal fibroids, once they are pregnant the miscarriage rate is similar.

Around 50 to 60% of fibroids increase in size during pregnancy. Most of this growth occurs during the first trimester, slowing in the second and third trimesters. *Large fibroids greater than 5cm are more likely to grow where as smaller fibroids may remain stable.* Size remains roughly stable after pregnancy, but about 10% will decrease in volume by around 10%.

It is important to realise that both the uterus and the fibroids increase in size by processes of hyperplasia and hypertrophy i.e. more muscle cells and greater size in muscle cells. The tissue cannot completely disappear after pregnancy but may shrink somewhat. Many women with fibroids do not have any complications during pregnancy related to the fibroid. Complications may however occur, with pain being the most common.

*To summarise, the effects of fibroids on pregnancy may include:*

1. Miscarriage
2. Premature labor and delivery
3. Abnormal fetal position requiring operative delivery
4. Placental abruption (the placenta peels away from the lining of the uterus)
5. Abnormal fetal growth
6. Morbidly adherent placenta (placenta unable to be expelled after the birth)

## What can happen to fibroids during pregnancy?

Larger fibroids of greater than 4 to 5cm are usually the ones that grow significantly. Review of data from studies involving IVF patients suggests that intramural fibroids probably increase the risk in miscarriage (odds ratio 1.6, 95% confidence limits 1.3 to 2). The risk of pregnancy loss may be higher in setting multiple fibroids than a single lesion. Again it is not completely understood why fibroids interfere with the pregnancy. It is possible, however, that they interfere with implantation and the development of a normal uteroplacental circulation.

Occasionally fibroids may undergo red degeneration, which means that the fibroid bleeds into its own interior. This may lead to increased uterine contractility, pains, or an alteration in the production of catalytic enzymes by the placenta, all of which may lead to disruption of the placenta and spontaneous abortion.

There is a small increase in pre term rupture of membranes, also an increased risk of placental abruption (the placenta shearing away from the uterine wall, odds in ratio 3.2, 95% confidence interval 2.6 to 4). One study suggests that submucosal fibroids and those behind the placenta have the greatest risk of association with placental abruption, especially if the fibroid has a volume of more than 200ml, or diameter 7cm.

There is no change in the incidence of placenta praevia or pre-eclampsia.

The effect on fetal growth is probably small. There is an increased risk of fetal malpresentation, with the chance of breech presentation increasing by 1.5 (95% confidence intervals 1.3 to 1.9). There is probably no effect on the progress of normal labor. The risk of caesarean section delivery is increased, as is the risk of postpartum hemorrhage (odds to ratio 1.8 95% confidence intervals 1.4 to 2.2) especially with fibroids of 3cm or more, or those located underneath the placenta.

### Is age a factor?

The age of women at the time of diagnosis of uterine fibroids, and especially the temporal relationship to childbearing, greatly influences management decisions. Rapid growth in fibroids may be more common in those diagnosed at less than 5cm in diameter. Prospective studies have found that a small proportion of fibroids *may actually regress* in size over several years, but the average growth is something in the order of 1 to 2cm every two years. Fibroids are fed by oestrogen therefore most, but not all, women experience shrinkage of fibroids at menopause. This is however very slow, and it is unlikely that the fibroids will ever completely disappear. Patiently waiting for menopause to arrive and shrink large symptomatic fibroids is, then, a long bow to draw!

Considering the above information regarding fibroid growth, fibroid size and the effects on fertility it is reasonable to consider elective removal of fibroids in any woman who has not completed her family, of greater than or equal to 5cm in diameter. This may be especially important in young women who have many years to go before child bearing. Management plans will also be altered by the patients' symptoms. There will always be a lower threshold to remove fibroids that are symptomatic, with heavy or irregular bleeding, pressure symptoms and pain the most common symptoms.

## Management of fibroids prior to IVF

The effect of fibroids on IVF is dependent upon their location: submucosal fibroids decrease the chance of success whereas subserosal fibroids probably have no effect. We believe that intramural fibroids may have a negative impact on IVF outcomes and removing any fibroid of 4cm or more is beneficial. As alluded to above current evidence suggests that it does not necessarily hold true for those planning a spontaneous conception. My feelings about this are that removing fibroids also introduces further potential morbidity such as adhesions, which may negate fertility benefits of fibroid removal. However, with modern surgery, meticulous technique, haemostasis and use of adhesion barriers when removing fibroids laparoscopically, I believe that many of these adverse factors can successfully be reduced or eliminated.

## What is known about the recommended route of delivery of a baby after removing fibroids?

Again this is a very difficult subject. The “exam answer” and probably the answer that the lawyers would like is that everyone who has had a fibroid removed, except if it is small and submucosal, is delivered by caesarean section. There have been cases of uterine rupture in labour, in women who have simply had small subserosal fibroids removed with very little damage to the underlying myometrium.

Risk factors for myometrial damage include method of fibroid removal and method of suture repair. There is no doubt, that extensive electro-surgical coagulation of the stalk of a fibroid, even if it is subserosal, may damage the underlying myometrium and contribute to uterine rupture. Some papers suggest that a simple single layer uterine closure is as good as a multiple layer closure, to prevent future uterine rupture. If a single layer closure is used meticulous homeostasis must be achieved in order to eliminate chance of intra myometrial hematoma and to achieve perfect tissue apposition. It is self evident that a neat multiple layer closure is more likely to achieve this.

Much data has been published regarding the mode of delivery after myomectomy. The risk of uterine rupture after a classical caesarean section (caesarean section involving a vertical incision through the uterine muscle instead of a low transverse incision) is around 1 to 2%. The risk of uterine rupture after removal of a large intramural fibroid may be as high as 3%. Obviously this means that 97% of women will not have a problem. Nonetheless in the contents of modern obstetrics where the caesarean section rate is 30 to 40 % anyway I would have to seriously consider the wisdom of opting for a vaginal delivery after removal of a large intramural fibroid.

Much was previously made about whether or not the fibroid removal breached the endometrial cavity as an indication for caesarean section. I frequently remove very large fibroids creating a large myometrial defect without entering the cavity but creating a very large uterine scar. I would be very uncomfortable recommending a vaginal birth in these women.

