Commentary

Myomectomy During Pregnancy and Delivery: Is it Safe?

Traditionally, obstetricians and gynaecologists had avoided performing myomectomy either during pregnancy or at caesarean section because of the fear that bleeding may be intractable as a result of the increased vascularity of the pregnant uterus. Yet, uterine leiomyomata, or fibroids as they are more commonly called, are the commonest tumours of the female pelvis, primarily affecting women in the age range at which they are likely to be pregnant. For obstetricians practicing in Africa, the chances of coming across a pregnant woman who has fibroids is much higher than it is in other parts of the world because uterine leiomyomata are 3 9 times more prevalent in Negroid women than in Caucasians[1]. Fibroids are associated with about 2% of all pregnancies, and up to 10% of affected women can be expected to develop complications, oftentimes resulting in caesarean delivery[2]. Such pregnancies are also more likely to be associated with adverse outcomes such as miscarriage, placental abruption and fetal growth retardation[3].

Leiomyomata undergo changes during pregnancy. Though they may be asymptomatic, they often enlarge, and tend to soften and flatten out, thereby becoming indistinct. Red degeneration (venous thrombosis and interstitial haemorrhage), a consequence of the differences in response to the hormonal changes of pregnancy by leiomyomata and the surrounding myometrium, gives rise to pain and constitutional symptoms that usually respond to conservative treatment. However, the abdominal pain may be so severe that emergency laparotomy is undertaken before the diagnosis is made. Severe abdominal pain may be due to torsion of a pedunculated fibroid with infarction, also necessitating a laparotomy. Fibroids located in the uterine lower segment may obstruct vaginal delivery and therefore require operative delivery[4]. Since the tumours are so common in childbearing women, it is to be expected that many obstetricians will have to confront the dilemma of how best to deal with fibroids on a gravid uterus at laparotomy or fibroids visible on the uterus after a baby is extracted at caesarean section.

In times past, it was the standard practice of obstetricians to leave such fibroids well alone, a policy that is understandable bearing the mind the risk of uncontrollable haemorrhage and an increased likelihood of sepsis if the woman had been in labour or membranes had ruptured before caesarean section was done. However, within the last two decades, there have been several reports, from diverse settings, documenting the safety of caesarean myomectomy[5, 6, 7, 8, 9, 10, 11, 12]. Some have also documented experiences with myomectomy performed for the management of complications during pregnancy[13, 14, 15]. Most of the available reports focus on caesarean myomectomy[9, 16, 17]. The publications were mainly case reports and descriptive studies but Sapmaz *et al* reported a randomized prospective comparison of two methods of maintaining haemostasis during caesarean myomectomy in 52 patients[18]. Two more cases of myomectomy during pregnancy and at caesarean delivery are reported in this issue of the journal [19,20]. In view of the foregoing, the time may now have come when a revision in attitudes toward surgical mangement of fibroids during pregnancy and at caesarean section is required.

Indications and Operative Technique

Myomectomy is generally contraindicated in pregnancy unless there are serious complications necessitating its use. Emergency myomectomy during pregnancy has been reported in the management of intractable pain, for fetal postural deformity and oligohydramnios, in the presence of other life threatening complications and to exclude malignancy [13, 14, 15, 21, 22, 23]. In the case reported by Nwagha *et al* [19], the fibroid (a pedunculated one) had undergone necrobiosis and rupture, creating an acute abdominal emergency. Spontaneous abortion has been reported as a complication of the procedure[22]. Placental trauma and haemodynamic alterations arising from myomectomy during pregnancy, especially in the first trimester, are potential causes of fetal malformations[24]. All of these authors however argue that, with careful patient selection, myomectomy during pregnancy is safe. Some even suggest that *elective* myomectomy be done during pregnancy as it may confer protection against spontaneous abortion and post-caesarean hysterectomy[25].

Until recently, caesarean myomectomy usually appeared in the literature as case reports of inevitable procedures. These reports had documented the safety of the operation[26, 27, 28]. Other reports have however appeared in the past few years documenting experience with caesarean myomectomy in larger numbers of patients and attesting to its safety [9, 12, 16, 29, 30]. Myomectomy at caesarean section is beneficial for a number of reasons. It obviates the need for a repeat laparotomy and reduces the complications associated with fibroids in subsequent pregnancies[12]. When located

in the lower uterine segment, lower segment caesarean section with myomectomy allows for vaginal delivery in subsequent pregnancies[27]. It is also a cost effective intervention particularly in resource-constrained settings.

The hyperactive immunology within the pregnant uterus may enhance healing following caesarean myomectomy. Myomectomy scars reviewed during subsequent caesarean sections[31] and also followed up with serial scans during later pregnancies[32] showed better properties compared with scars of myomectomy performed outside pregnancy. This may promote optimal functional recovery and confer a favourable outcome in subsequent pregnancies.

Despite these suggested benefits, however, the contentious issue regarding caesarean myomectomy remains the haemorrhage that could accompany the procedure. The operation has been reported to be associated with a 10% increase in blood loss[10]. This increased risk of haemorrhage may be in association with placenta praevia and abruption. Higher blood loss associated with the procedure was also reported by earlier workers[6]. Sapmaz *et al* also showed significant positive correlation between the duration of the procedure and blood loss and the number of enucleated myomas during myomectomy[18]. However, other investigators conclude that blood loss during caesarean section compared with caesarean myomectomy are not significantly different and therefore recommend that it is a safe procedure[9, 12, 16, 29]. A retrospective case control analysis of 40 patients who had caesarean myomectomy compared with 40 patients who also had myomas, but had caesarean section alone showed no significant difference in the frequency of blood transfusion[16]. All authors admitted caesarean myomectomy is a technically challenging operation; hence the constant refrain that it should only be undertaken by experienced obstetricians.

The application of a tourniquet applied round the base of the broad ligament to compress both uterine arteries and vessels in the infundibulo-pelvic ligament has been described as a way of reducing blood loss during caesarean myomectomy[28, 33]. The use of tourniquet may however be difficult and potentially traumatic in these patients because of the large size of the uterus. Other authors prefer high dose oxytocin which has been reported to be effective in some series[9, 29, 30]. The oxytocin infusion is maintained for several hours post-surgery. Intramyometrial vasopressin may potentiate the effect of oxytocin[34]. However, Brown *et al* caution on the risk of its inadvertent intravascular injection and the associated complications[9].

Sapmaz *et al* compared bilateral ascending artery ligation with tourniquet use in a prospective randomized study of 52 patients[18]. The total intra-operative blood loss and total operation duration were similar in the two groups. However, one patient in the tourniquet group required repeat laparotomy and bilateral internal iliac artery ligation for post-operative haemorrhage. They conclude that tourniquet may not provide continuing haemostasis post-operation. However, it is important to bear it in mind that bilateral uterine artery ligation may have implications for future fertility.

Contraindications to caesarean myomectomy may include the presence of pelvic adhesions, multiple fibroid nodules that may require more than one incision and patients in whom the haemodynamic status is already tenuous or unstable.

Morbidity and Recurrence of Myomas

Caesarean myomectomy has not been found to be associated with increased morbidity. Investigators report lack of differences in post-operative haemoglobin concentration, febrile morbidity or post-operative hospital stay between patients having caesarean myomectomy and those having caesarean section[9, 28, 29]. There was no documentation of the need for hysterectomy or fatality.

Changes during pregnancy may mask the presence of some fibroid nodules at surgery. Ande *et al* reported a case of recurrent fibroids following caesarean myomectomy that was safely removed at repeat caesarean myomectomy[17]. These authors contend that recurrent fibroids may occur more frequently after caesarean myomectomy compared with routine myomectomy as a consequence of pregnancy changes making the fibroids less visible.

Should Caesarean Myomectomy Become a Routine Operation?

The level of evidence currently available on this option of care is in the form of case reports, retrospective case control studies and limited prospective randomized studies. A search of MEDLINE, PubMed and the Cochrane Library using the MeSH terms myomectomy, pregnancy, caesarean section, myoma and fibroids as well as the references of identified articles did not yield randomized controlled trials or systematic reviews of trials on this subject. The total number of subjects remains well below 500 women.

The evidence base is thus not sufficiently strong at this point to recommend routine caesarean myomectomy in clinical practice. No rigorous study has evaluated this form of care to influence policy. Policy may remain guided by the assumption that clinicians tend not to report negative events; only successes get publicized. The observation that tourniquet application may not provide continuing haemostasis post-operation[18] is an indication that the operative technique requires further investigation. Therefore well-designed randomized controlled trials and synthesis of the findings are urgently needed to guide policy. Such trials are best conducted through collaboration among institutions in developing countries.

Conclusion

Pending the availability of reliable evidence, what is currently known suggests that myomectomy can be performed safely during pregnancy and at caesarean delivery, especially where the fibroids are causing complications or preventing access to the site of the uterine incision at caesarean section. Despite the potential benefits inherent in caesarean myomectomy however, caution against its routine use should be exercised until sufficient and convincing evidence is available. This is especially so in the developing country setting where emergency response remains inadequate.

Akinyinka O. Omigbodun

and

Adeniran O. Fawole

Department of Obstetrics & Gynaecology
University College Hospital,
Ibadan, Nigeria

References

1. Ogedengbe OK. Uterine fibroids. In: Okonofua F, Odunsi K (eds.), *Contemporary Obstetrics and Gynaecology for developing countries.* Benin City: Women's Health and Action Research Centre, 2003: 202 213.
2. Roberts WE, Fulp KS, Morrison JC, Martin JN Jr. The impact of leiomyomas on pregnancy. *Austr N Z J Obstet Gynaecol*, 12: 76 78.
3. Lumsden MA, Wallace EM. Clinical presentation of uterine fibroids. *Baillieres Clin Obstet Gynaecol*, 1998; 12: 177 195.
4. Hasan F, Arumugam K, Sivanesaratnam V. Uterine leiomyomata in pregnancy. *Int J Gynecol Obstet*, 1991; 34: 45 48.
5. Monnier JC, Bernadi C, Lanciaux B, Vinatier D, Lefebvre C. Fibroma and pregnancy. Apropos of 51 case reports surveyed from April 1976 to December 1984. *Rev Fr Gynecol Obstet, 1986; 81: 99 104.*
6. Hsieh TT, Cheng BJ, Liou JD, Chiw TH. Incidental myomectomy in caesarean section. *Changgeng Yi Xue Za Zhi*, 1989; 12: 13 20.
7. Spadaro M, Tresoldi M, Dalla Pria S. A case of myomectomy in the course of cesarean section. *Minerva Gineol*, 1992; 44: 343 344.
8. Michalas SP, Orepoulou FV, Papageorgiou JS. Myomectomy during pregnancy and caesarean section. *Hum Reprod*, 1995; 10: 1869 1870.
9. Brown D, Fletcher HM, Myrie MO, Reid M. Caesarean myomectomy.....a safe procedure. A retrospective case controlled study. *J Obstet Gynaecol*, 1999; 19: 139 141
10. Dimitrov A, Nikolav A, Stamenov G. Myomectomy during cesarean section. *Akush Ginekol (Sofia)*, 1999; 38: 7 9
11. Pajszczyk-Kieszkiewicz T, Kazimierakw W, Lech W, Lipecka-Kidawska E, Sieroszewski P, Kowalska-Koprek U. Leiomyomas in pregnancy. *Ginekol Pol*, 2002; 73: 291 296.
12. Kwawukumeh EY. Caesarean myomectomy. *Afr J Reprod Hlth*, 2002; 6: 38 43.
13. Celik C, Acar A, Cicek N, Gezginc K, Akyurek C. Can myomectomy be performed in pregnancy? *Gynaecol Obstet Invest*, 2002; 53: 79 83
14. Hasbargen U, Strauss A, Summerer-Moustaki M, Baretton G, Roth U, Kimmig R, Hepp H. Myomectomy as a pregnancy-preserving option in the carefully selected patient. *Fetal Diagn Ther*, 2002; 17: 101 103
15. Joo JG, Inovay J, Silhavy M, Papp Z. Successful enucleation of a necrotizing fibroid causing oligohydramnios and fetal postural deformity in the 25th week of gestation. A case report. *J Reprod Med*, 2001; 46: 923 -925.
16. Kaymak O, Ustunyurt E, Okyay RE, Kalyoncu S, Mollamahmutoglu L. Myomectomt during caesarean section. *Int J Gynecol Obstet*, 2005; 89: 90 93
17. Ande AB, Ehigiegba AE, Umeora OU. Repeat myomectomy at caesarean section. *Arch Gynaecol Obstet*, 2004; 270: 296 298
18. Sapmaz E, Celik H, Altungul A. Bilateral ascending uterine artery ligation vs. tourniquet use for haemostasis in cesarean myomectomy: A comparison. *J Reprod Med*, 2003; 48: 950 954
19. NwaghaUI, Agu KA, Nwankwo TO, Egbuji CC. Emergency myomectomy during pregnancy: a case report. *Trop J Obstet Gynaecol*, 2005; 22: 79-80
20. Agboghoroma CO, Efetie ER, Umezulike AC. Unavoidable caesarean myomectomy: a case report. *Trop J Obstet Gynaecol*, 2005; 22: 81-82
21. Febo G, Tessarolo M, Leo L, Arduino S, Wierdis T, Lanza L. Surgical management of leiomyomata in pregnancy. *Clin Exp Obstet Gynaecol*, 1997; 24: 76 78.
22. De Carolis S, Fatigante G, Ferrazzani S, Trivellini C, De Santis L, Mancuso S, Caruso S. Uterine myomectomy in pregnant women. *Fetal Diagn Ther*, 2001; 16: 116 119.
23. Wittich AC, Salminen ER, Yancey MK, Markenson GR. Myomectomy during early pregnancy. *Mil Med*, 2000; 165: 162 164.
24. Danzer E, Holzgreve W, Batukan C, Miny P, Tercanli S, Hoesli I. Myomectomy during the first trimester associated with fetal limb anomlies and hydrocephalus in a twin pregnancy. *Prenat Diag*, 2001; 21: 848 851.
25. Mollica G, Pittini L, Minganti E, Perri G, Pansini F. Elective uterine myomectomy in pregnant women. *Clin Exp Obstet Gyecol*, 1996; 23: 168 172.
26. Ehigiegba AE, Evbuomwan CE.Inevitable caesarean myomectomy. *Trop J Obstet Gynaecol*, 1998; 15: 62
27. Omar SZ, Sivanesaratnam V, Damodaran P. Large lower segment myoma myomectomy at lower segment caesarean section a reporto f two cases. *Singapore Med J*, 1999; 40: 109 110.
28. Ezechi OC, Kalu BKE, Okeke PE, Nwokoro CO. Inevitable caesarean myomectomy: a case report. *Trop J Obstet Gynaecol*, 2003; 20: 159-160
29. Ehigiegba AE, Ande AB, Ojobo SI. Myomectomy during caesarean section. *Int J Gynecol Obstet*, 2001; 75: 21 -25
30. Ehigiegba AE, Ande AB, Ojobo SI. Caesarean myomectomy: a new frontier in surgical practice. *Afr J Reprod Hlth*, 2003; 7: 125
31. Cobellis L, Messali EM, Stradella L, Pecori E, Gionio E, De Lucia E, Cobellis G. Myomectomy during cesarean section and outside pregnancy. Different outcomes of scars. *Minerva Ginecol*, 2002; 54: 483 486
32. Cobellis L, Messali EM, Stradella L, Pecori E, Cobellis G. Restitutio ad integrum of myometrium after myomectomy. Different results in pregnant and non-pregnant patients. *Minerva Ginecol*, 2002; 54: 393 395.
33. Kwawukume EY. Caesarean section in developing countries. *Best Pract Res Clin Obstet Gynaecol*, 2001; 15: 165 178.
34. Dimitrov A. The use of the vasoconstrictor hemostatic Remestyp in surgical obstetrics. *Akush Ginekol (Sofia)*, 1999; 38: 58 -60