

Necessity of Combined Spinal Epidural Technique During Open Abdominal Myomectomy for Huge Uterine Fibroids

¹Otokwala J.G., ²Ebirim L.N.

¹Department of Anaesthesiology, University of Port Harcourt

²Department of Anaesthesiology, University of Port Harcourt

ABSTRACT

Background: Open abdominal myomectomy is commonly done to remove uterine fibroids which plague several Africans and people of African origin especially at the prime of their reproductive careers. Various anaesthetic techniques have been described for this surgical procedure. Some of the techniques have disadvantages.

Objective: The aim of this study was to demonstrate the necessity and safety of the combined spinal epidural technique during open abdominal myomectomy for huge uterine fibroids.

Methodology. A 5 years prospective study of 100 women with huge uterine fibroids, who had open abdominal myomectomy with combined spinal epidural (CSE) technique at Nimley Medical Consultants hospital, Kelsey Harrison hospital and the University of Port-Harcourt teaching hospital, was done. Data collected were analyzed with statistical package for social sciences (SPSS) version 17.0. P value < 0.05 was regarded as statistically significant.

Results. The mean age of the women was 32.53 ± 0.66 years. The mean fibroid size was 30.15 ± 0.68 weeks and the mean surgical duration was $178.98 \pm$

3.31 minutes. The epidural component of the CSE was activated after a mean time of 106.15 ± 3.22 minutes from the initiation of spinal anaesthesia at a mean numeric pain rating score (NRS) of >3 cm. The rate of perioperative complications was low.

Conclusion. Combined spinal epidural technique is a safe and necessary technique with relatively low rate of perioperative complications when used during open abdominal myomectomy for commonly found huge African fibroids.

INTRODUCTION

Uterine fibroids are common especially in Africans of reproductive age. The incidence has been observed to increase with increasing age¹. Racial predilection in favour of the Negro race has been reported^{2,3,4}. Large uterine fibroids are defined as fibroids that are more than 7cm in size⁵ and it is common to observe patients present with fibroids that often extend to the xyphisternum. In one study of 100 women presenting with uterine fibroids, the sizes of the uteri ranged from being bulky to 36 weeks gestation, median being 20 weeks gestation.³ The reason for such a late presentation is not unrelated to the link of fibroids to infertility and poverty which often render the patients unable to pay for needed surgical treatment. Also, fear about possible reproductive outcome if the tumour is surgically removed and the common recourse to alternative medical practices⁶ are other possible reasons for their late presentation. These reasons account for the availability of huge and giant uterine

Corresponding Author:

Dr. LONGINUS. N Ebirim
Department of Anaesthesiology,
College of Health Sciences
University of Port Harcourt
Port Harcourt, Nigeria.
+2348033384198

Email: longinus.ebirim@uniport.edu.ng

fibroids in Africans which obviously are beyond the scope of laparoscopic myomectomy and would require open surgery^{3,7,8}.

The increase in the prevalence of pre-operative anaemia from menorrhagia in patients with huge fibroids^{9,10} remains a risk factor for increased perioperative blood loss^{11,12}. Thus the anaesthetic technique that can reduce perioperative blood loss should be considered because of the reported association between anaesthesia type and risk of perioperative blood loss¹³.

Various anaesthetic techniques have been described for the surgical removal of uterine fibroids³. Regional anaesthesia or general anaesthesia using ketamine and a benzodiazepine are the commonly used techniques in resource limited areas,^{3,14} especially in anaesthesia work force limited areas. The size of the fibroid could influence the choice of anaesthesia. In this prospective study, we set out to analyze the outcome for women who presented with huge uterine fibroids and for whom combined spinal epidural (CSE) technique was used for open abdominal myomectomy.

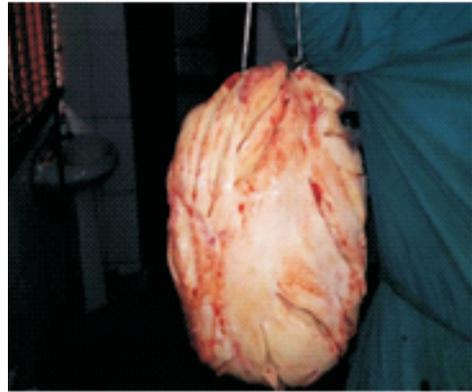


Figure 1: Typically huge African uterine fibroids for open abdominal myomectomy under CSE.

METHODOLOGY

Institutional Research and Ethics Committee approvals were obtained from the respective specialist health facilities and written informed consents with detailed information about the technique and the requirement for postoperative pain relief were duly obtained from the patients. The permission to use the picture of the patient with the 36 weeks size uterine fibroids for the sake of this publication was duly obtained. The study period spanned from November 2012 to November 2017. Patients with American society of Anesthesiologists (ASA) physical status classification 1 or 2 were studied. Excluded were patients who were converted to general anaesthesia with confirmed failed regional anaesthesia (failure to achieve T6 sensory level 20 minutes after the administration of the spinal component or Numerical pain rating score of > 3cm 20 minutes after activation of the epidural component) and all absolute contra-indications to spinal anaesthesia.

The patients were pre-operatively reviewed to ascertain their fitness for the study and consent was obtained for the CSE technique. Appropriate number of units of blood was grouped and cross matched. Baseline vital signs were recorded. In a sitting position, the back of each patient was cleaned with povidone iodine, draped and the lumbar puncture site anaesthetized with 2ml of 1% lidocaine. The epidural catheterization was done using 17G Tuohy needle with the loss of resistance

to air technique to identify the epidural space at L2/L3 intervertebral level..About 5cm of the catheter was inserted into the epidural space while 2ml of .1% lidocaine as test dose was injected to confirm correct placement of the epidural catheter.The spinal component was administered at L4/L5 level, using 25G pencil point Whitacre needle. With the free flow of cerebrospinal fluid 15mg of 0.5% hyperbaric bupivacaine with 25µg fentanyl was injected and the patient returned to the supine position. Following the administration of spinal anaesthesia, the maximal sensory block level was defined and if adequate (T6 level), surgery was allowed to proceed. The numeric pain rating score (NPRS) was used to decide when to activate the epidural component. This was defined as a NPRS of 3cm.The following parameters were duly collated: The mean age of the patients, the mean size of the fibroids in weeks, the mean duration of spinal anaesthesia, the NPRS mean score for top up, the median maximal sensory block, the complications, the median modified Bromage score and the success of the technique for huge fibroids.At the end of surgery, the epidural catheter was either removed or retained for postoperative analgesia. The authors were responsible for administration of both the spinal and epidural procedures. At the end of the surgical procedure, 100mg of rectal diclofenac was inserted by the assistant or lead surgeon.

All data were prospectively collated over the five year period and fed into a spread sheet and duly analyzed using the statistical package for social sciences (SPSS) version 17.0 software (SPSS, Chicago IL, USA) for windows. The results were displayed in tables and expressed as mean and standard deviation. A p value<0.05, was accepted as statistically significant.

RESULTS

One hundred and five patients who presented for open abdominal myomectomy at the various gynaecological health facilities were recruited for the study. Five patients (approximately 5%) were disqualified in the final analysis for inadequate analgesia after 20minutes of intrathecal injection of

0.5% bupivacaine or epidural injection of the local anaesthetic drug. Block height of at least T6 was taken as adequate for surgery to proceed. When this was not achieved, the surgery was done under general anaesthesia. The mean age of the patients, the mean size of the uterine fibroids by clinical examination and the mean time to initiate and activate the epidural analgesia are shown in table I. Ten percent of the patients had preoperative anaemia(haemoglobin level <10gm%) but they were not transfused prior to surgery because the targeted preoperative haemoglobin level for transfusion was 7gm%.¹⁵ The mean estimated blood loss was 400mls with the routine use of the uterine tourniquet in all the patients. The prevalence of perioperative nausea and vomiting is also shown in table II. The duration of spinal analgesia was 90-120 minutes for 70% of the patients as shown in table III.

Table 1: Demographic and clinical characteristics of the patients.

MEAN AGE (YEARS)	32.53 ±0.66
MEAN SIZE OF FIBROIDS (WEEKS)	30.15 ±0.68
PREOPERATIVE ANAEMIA	10(10%)
MEAN DURATION OF SURGERY (MINUTES)	178.98 ±3.31
MEDIAN MAXIMAL SENSORY BLOCK LEVEL	T5
MEDIAN BROMAGE SCORE IN 5MINUTES	3
MEAN BLOOD LOSS (ML)	463.67±13.08
MEAN TIME TO TOP UP(MINUTES) AT NPRS 3CM	106.15 ±3.22

Table 2: Perioperative complications

COMPLICATIONS	FREQUENCY
NAUSEA	6 (6%)
VOMITING	6 (6%)
INADEQUATE ANALGESIA	5 (5%)

Table 3: Duration of spinal analgesia

TIME TO TOP UP	NO. OF PATIENTS
60-90MINS	15
91-120MINUTES	70
➤ 120MINUTES	15

DISCUSSION

Open abdominal myomectomy especially for huge uterine fibroids is a common practice in Nigeria.^{3,8} Very often, there is preoperative anaemia from menorrhagia and increased intraoperative blood loss may be encountered especially if the uterine tourniquet is not used or if it is inappropriately applied to control intra-operative bleeding. Duration of surgery may be prolonged and there is usually the tendency for an increased blood loss when general anaesthesia is used^{8,13}. These are potential risk factors for perioperative morbidity and mortality.

Some techniques of regional anaesthesia have been described for management of open myomectomy such as the single shot spinal anaesthesia¹⁶, and combined spinal epidural (CSE) anaesthesia¹⁷. The advantages of each technique over the others depend on the perioperative findings such as the duration of surgery, the presence of adhesions and the number and ease of extracting the fibroids. These factors are relevant to the choice of anaesthetic technique.

Single shot spinal anaesthesia has a limited duration of action and the alternative options include the use of either continuous spinal anaesthesia (CSA) or the combined spinal epidural technique.¹⁸ The CSA technique with intra-thecal catheters can be used to titrate the level of sensory blockade to the desired dermatomal level with great precision, allowing better control of the haemodynamic consequences of sympathetic blockade associated with spinal anaesthesia compared to epidural or single shot

spinal technique.¹⁹ However, the rate of postdural puncture headache (PDPH) when newer catheters designed for CSA are used is considerably higher than that reported with epidural catheters and CSE techniques.²⁰ A recent study has concluded that routine use of the CSA technique may occur only after development of equipment and techniques that reduce the rate of PDPH and difficulties in placement over that currently available.²¹ We therefore used the CSE technique within this 5 year study period for patients who presented with very huge uterine fibroids. These huge fibroids would have been removed by hysterectomy but for reasons such as infertility in an environment that places a high premium on child birth³, The CSE technique becomes ideal to circumvent the inadequacy of the single shot spinal anaesthesia and the risks associated with general anaesthesia. Some centers prefer general or ketamine anaesthesia for open abdominal myomectomy^{3, 14}. General anaesthesia with tracheal intubation and muscle relaxation can provide an excellent perioperative condition²² but runs the risk of airway complications. Conducting general anaesthesia in resource limited centers may be associated with some difficulties. Blood loss is more when compared with regional anaesthesia¹³.

The age of the patients, parity and uterine size are in keeping with findings of most local studies on the prevalence of huge uterine fibroids in Nigeria^{6,23}.

The mean duration of the surgical procedure was about three hours in this study although it could be less as documented by Geidamet al²³ or more. Anaesthesia of adequate duration contributes to a smooth perioperative period. Results of this study showed the onset of NPRS >3cm to be within 106 minutes after the institution of spinal anaesthesia in over 70% of the patients. Sunanda et al¹⁸ activated the epidural component within 80 minutes of the institution of spinal anaesthesia. Although in their study a much lower dose of intrathecal bupivacaine 2.5mg was used while we used 15mg of heavy bupivacaine to achieve a much longer duration of spinal analgesia. This makes ready availability of rescue analgesia necessary when needed and it was provided by

activating the epidural analgesia. The single shot technique which lacks the option of prolongation of analgesia when needed obviously has a disadvantage

The use of ketamine anaesthesia to supplement regional anaesthesia has been described.³ Other studies reported the use of propofol, opioids or clonidine as sedatives.²² These techniques however, pose some danger for an unprotected airway. In rural practice without the presence of an anaesthetist, it is a readily available option but airway protection is necessary. Fibroid sizes in excess of 16 weeks and occasionally in multiples and sometimes presenting as a re-occurrence have the tendency to prolong the perioperative period beyond the limits of single shot analgesia and would often require the administration of ketamine and analgesics like pentazocine. These medications are often administered with the airway unprotected and occasionally with full conversion to general anaesthesia with tracheal intubation^{23,24}. These circumstances can be avoided with the use of the combined spinal epidural technique which combines the shorter onset time of the spinal component and the feasibility of administering and extending the epidural component. The use of the tourniquet helped to reduce blood loss, which was also influenced by the use of regional anaesthesia. Duration of surgery beyond four hours, multiple fibroids and recurrent myomectomies with adhesions tend to contribute to increasing perioperative complications and the risk of blood transfusion²⁴ The average duration of surgery in our study was about three hours unlike the 60-120 minutes observed by Geidam et al²³ but with minimal complications and with fewer blood transfusions even with some patients presenting with 30 weeks and above uterine sizes. This was the advantage conferred by the CSE technique.. The skills required for use of the CSE technique may not be available at all of the surgical centres within our sub-region. Early acquisition of this skill by anaesthesia trainees is necessary and it can be done with determination and frequent practice.

CONCLUSION

Use of combined spinal epidural anaesthesia during open myomectomy for huge uterine fibroids is necessary and safe. Perioperative complications are minimal. This technique is cost effective and can be used in resource limited environments.

CONFLICT OF INTEREST: None to declare

FUNDING DISCLOSURE: None to declare

REFERENCES

1. Newbold PR, DiAugustine PR, Risinger JJ, Everitt JJ et al Advances in Uterine leiomyomas research. Conference overview, summary and future research 2000.
2. Baird DD, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyoma in black and white women: Ultrasound evidence. *Am J Obstet Gynecol.* 2003; 188:100–107
3. Ndububa VI, Uterine fibroids: Experience with 100 myomectomies in Orlu, South East Nigeria. *Port Harcourt Med J* 2016; 10:124-129
4. Ogunniyi SO, Fasubaa O. Uterine fibromata in Ilesha, Nigeria. *Nig. Med Pract* 1990; 19:93-95.
5. Kwawukume EY Uterine leiomyomas in: Kwawukume EY, Emuveyan EE (eds) *Comprehensive gynaecology in the Tropics.* Accra Graphics Packaging Ltd 2005; 124-127
6. Adegbesan-Omilabu MA, Okunade KS, Gbadegesin A: Knowledge of, Perception of, and Attitude towards Uterine Fibroids among Women with Fibroids in Lagos, Nigeria. *Scientifica (Cairo)* 2014, 2014: 809536.
7. Atombosoba A, Ekine I, Lucky O, Lawani et al Review of the Clinical Presentation of Uterine Fibroid and the effect of Therapeutic Intervention on Fertility. *Amer. J ourl of Clinical Med Res* 2015; vol3(1): 9-13 DOI:10.12691/ajcmr-3-1-2
8. Ezeama C, Ikechebelu J, Obiechina N, Ezeama N: Clinical Presentation of Uterine Fibroids in Nnewi, Nigeria: A 5-year Review. *Ann Med Health Sci Res* 2012, 2: 114-118.

9. Ehigiegba AE, Evbuomusa EE. Inevitable caesarean myomectomy. *Tropical J. ObstetGynaecol* 1998;15-62
10. Obuna JA, Umuora OU, Ejikike BN, Egwuatu VE. Uterine fibroids in the tertiary health centre in South East Nigeria. *Niger J. Med* 2008; 17: 447-451
11. Tokarey AA, Butylin AA, Atullakhanov FI. Platelet adhesion from shear blood flow is controlled by near-wall rebounding collisions with erythrocytes. *Biophys J* 2011;100(4):799-808
12. Tettey M, Aniteye E, Sereboe L, Edwin F et al. Predictors of postoperative bleeding and transfusion in cardiac surgery. *Ghana Med J.* 2009; 43(2): 71-76
13. Aggo AT, Fyneface-Ogan S, Mato CN. The differential impact of two anaesthetic techniques on cortisol levels in Nigerian surgical patients *Nig. J. Of ClinPract* 2012; 68-74
14. Nnaji CT, Chikwe K. Anesthesia for abdominal myomectomy - A five years audit of a Federal Medical Centre in Owerri, Nigeria. *JAnestAnesthes* 2017;1(1): 16-19
15. Carson J L, Stanwoth SJ, Roubinan N Fergusson DA. et.al. Transfusion thresholds and other strategies for guiding allogeneic red cell transfusions. *Cochrane Data base Syst Rev* 2016;Oct:12:10:CD002042.
16. Sule AZ, Isamade ES, Ekwempu CC Spinal anaesthesia in lower abdominal and limb surgery: A review of 200 cases *Nig J of Surg Res* 2005;7:226-230
17. Stamenkovic DM, Geric V, Slavkovic Z, Raskovic J, et al Combined spinal-epidural analgesia versus intermittent bolus epidural analgesia for pain relief after major abdominal surgery. A prospective randomized double-blind clinical trial. *Int J. ClinPract* 2008;62: 255-262
18. Sunanda G, Reema M, Prem RN. Combined spinal epidural anaesthesia for myomectomy in an achondroplastic dwarf. *Indian J Anaesth* 2005; 49: 430-431
19. Palmer CM. Continuous spinal anesthesia and analgesia in obstetrics. *AnesthAnalg.* 2010; 111: 1476-1479.
20. Baysinger CL. Accidental dural puncture and post-dural puncture headache management. *IntAnaesthesiolClin.* 2014; 52: 18-39.
21. Velickovic I, Pujic B, Baysinger CW, Baysinger C. Continuous spinal Anesthesia for Obstetric Anesthesia and Analgesia. *Front Med (Lausanne)* 2017; 4: 133
22. Bouzlama A, Echehoumi H, Smairi S, Ben JK. A single intravenous dose of clonidine(4µg/kg) given before induction reduces nausea and vomiting in patients after myomectomy under general anaesthesia. *9AP3-11 Eur J. Anaesth* 2013; 30:148
23. Geidam AD, Lawan ZM, Chama C, Bako BG Indications and outcome of abdominal myomectomy in University of Maiduguri Teaching Hospital: Review of Ten year *Nig Med J* 2011 ; 52: 193-197
24. KikelomonTA, Owolabi BO, Raji HO, Olarinoye AO. Abdominal Myomectomy: A retrospective review of determinants and outcomes of complications at the University of Ilorin Teaching Hospital, Ilorin , Nigeria. *Malawi Med J* 2017; 29: 37-42.