International Journal of Gynecology and Obstetrics 121 (2013) 208–213

Contents lists available at SciVerse ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo

REVIEW ARTICLE

Myomectomy during cesarean delivery

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ARTICLE INFO

Article history:
Received 13 November 2012
Received in revised form 16 January 2013
Accepted 21 February 2013

Keywords:
Cesarean delivery
Leiomyoma
Meta-analysis
Myomectomy
Systematic review

ABSTRACT

Background: The optimal management of leiomyomas during cesarean delivery is unclear. *Objectives:* To assess the safety of myomectomy performed during cesarean delivery. *Search strategy:* PubMed, MEDLINE, EMBASE, and Cochrane Library were searched to identify potentially relevant studies published prior to June 30, 2012. *Selection criteria:* Case-control study comparing myomectomy with no myomectomy in patients undergoing cesarean delivery. *Data collection and analysis:* The quality of the studies was assessed and data were extracted independently by 2 authors. *Main results:* Nine studies, including 1 082 women with leiomyomas, met the inclusion criteria; 443 (41.0%) women underwent cesarean myomectomy and 639 (59.1%) underwent cesarean delivery alone. The drop in hemoglobin after surgery was 0.30 g/dL greater in the cesarean myomectomy group than in the control group, but the difference was not significant. The operative time was 4.94 minutes longer in the cesarean myomectomy group, but again the difference was not significant. The overall incidence of fever was comparable in the 2 groups. No hysterectomies were performed in any of the included studies. *Conclusions:* Cesarean myomectomy may be a reasonable option for some women with leiomyoma. However, no definite conclusion can be drawn because the data included in the meta-analysis were of low quality.

1. Introduction

Uterine leiomyomas are the most common uterine neoplasm. By age 35, more than 60% of nonpregnant African-American women and almost 40% of nonpregnant white women have leiomyomas identifiable by imaging [1]. Indeed, leiomyomas are found in up to 77% of women if the uterus is examined closely at autopsy [2]. Most leiomyomas are asymptomatic and might not need any therapy, but some induce abnormal uterine bleeding, pain or menorrhagia, pressure symptoms, urinary tract symptoms, infertility, anemia secondary to chronic blood loss, and recurrent pregnancy loss. In addition, leiomyomas can grow rapidly and continue to grow after menopause, and sarcomatous changes might occur, which will become major indications for aggressive management. Approximately 25% of women with leiomyomas experience symptoms that require treatment [3].

The incidence rate of uterine leiomyomas in pregnancy varies between 1.6% and 10.7% depending on the trimester of assessment [4–7], with fibroids more common among women of advancing maternal age. As cesarean rates continue to rise [8] and as the obstetric population ages [9–11], obstetricians can expect to be confronted with increasing myoma numbers during cesarean delivery.

Cesarean myomectomy has traditionally been discouraged because of concerns about intractable hemorrhage, requiring hysterectomy in extreme cases, and concerns about increased postoperative morbidity. Women who have successfully carried a pregnancy to cesarean delivery probably do not fulfill the conventional indications for medical intervention for their fibroid. Some authors [12,13] have challenged the traditional viewpoint, however, and suggest that myomectomy may, in fact, be performed at the time of cesarean delivery with selected patients. Reported benefits of such an approach include reduction of the risk associated with anesthesia by decreasing the need for subsequent operation, and reduction of the total cost [14]. The adequate management of leiomyomas, whether newly identified or previously known, is not as straightforward as once thought.

The present review aims to assess the advantages and disadvantages of myomectomy during cesarean delivery by meta-analysis of a series of case-control studies.

2. Materials and methods

PubMed, MEDLINE, EMBASE, and the Cochrane Library of Systematic Reviews were used to identify potentially relevant studies. The databases were searched without language restrictions, using the keywords “cesarean delivery”, “myomectomy”, “uterine myoma”, and “pregnancy with leiomyoma”. The proceedings of international meetings and the reference lists of identified studies, textbooks, and previously published reviews were also searched. The latest date for

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0020-7292/$ – see front matter
http://dx.doi.org/10.1016/j.ijgo.2013.01.021

the search was June 30, 2012. The studies for inclusion were selected by 2 authors.

Studies were included if they met the following criteria: (1) Case-control study; (2) compared the advantages and disadvantages of removing myomas as opposed to not removing them in women undergoing cesarean delivery; (3) reported on at least 1 of the outcomes mentioned later in this section. If the same study (conducted at the same institution and/or by the same authors) was reported twice in different journals, the paper published in the journal with the highest impact factor or the most recent publication was included in the analysis.

The following outcomes were used to compare patients undergoing myomectomy during cesarean delivery with those undergoing cesarean delivery alone: Preoperative and postoperative hemoglobin, drop in hemoglobin, estimated blood loss, incidence of hemorrhage (defined as a decrease in hematocrit of 10 points from the preoperative value to the postoperative value), operative time (calculated from skin incision to skin closure), length of hospital stay, frequency of blood transfusion, incidence of fever (defined as temperature higher than or equal to 38.0 °C), and need for hysterectomy.

The meta-analysis was performed according to recommendations from QUORUM [15], MOOSE [16], and the Cochrane Collaboration [17]. For dichotomous data, results for each study are described as an odds ratio (OR) with 95% confidence intervals (CIs). For continuous outcomes, a fixed-effects model was used and data were pooled to calculate the weighted mean difference (WMD) with 95% CIs. Some studies reported a mean change or percentage change from baseline values, whereas other studies only reported medians and ranges; in such instances, the median was regarded as being identical to the mean and an estimate of the standard deviation was calculated from the range [(range × 0.95)/4].

Heterogeneity was evaluated using the I^2 statistic [18], with an I^2 value of more than 50%, $P < 0.01$ being considered statistically significant for heterogeneity. Fixed-effect models were used if the heterogeneity was not significant. Otherwise, a random-effects model was used. The Yates correction was used for outcomes with 0 events of interest in 1 of the study groups [19,20]. Outcomes with 0 events in either group were discarded from the meta-analysis. A funnel plot was performed for all significant outcomes to consider the possibility of bias. The analysis was performed using the statistical software Review Manager (RevMan) 5.0 (Nordic Cochrane Centre, Cochrane Collaboration, Copenhagen, Denmark).

3. Results

The search identified 9 case-control studies [12,13,21–27] that compared the outcomes of women with uterine leiomyomas who underwent cesarean myomectomy versus cesarean delivery alone (Fig. 1). The analysis included 3 studies [21,24,27] in which the control group (cesarean delivery alone) comprised women without

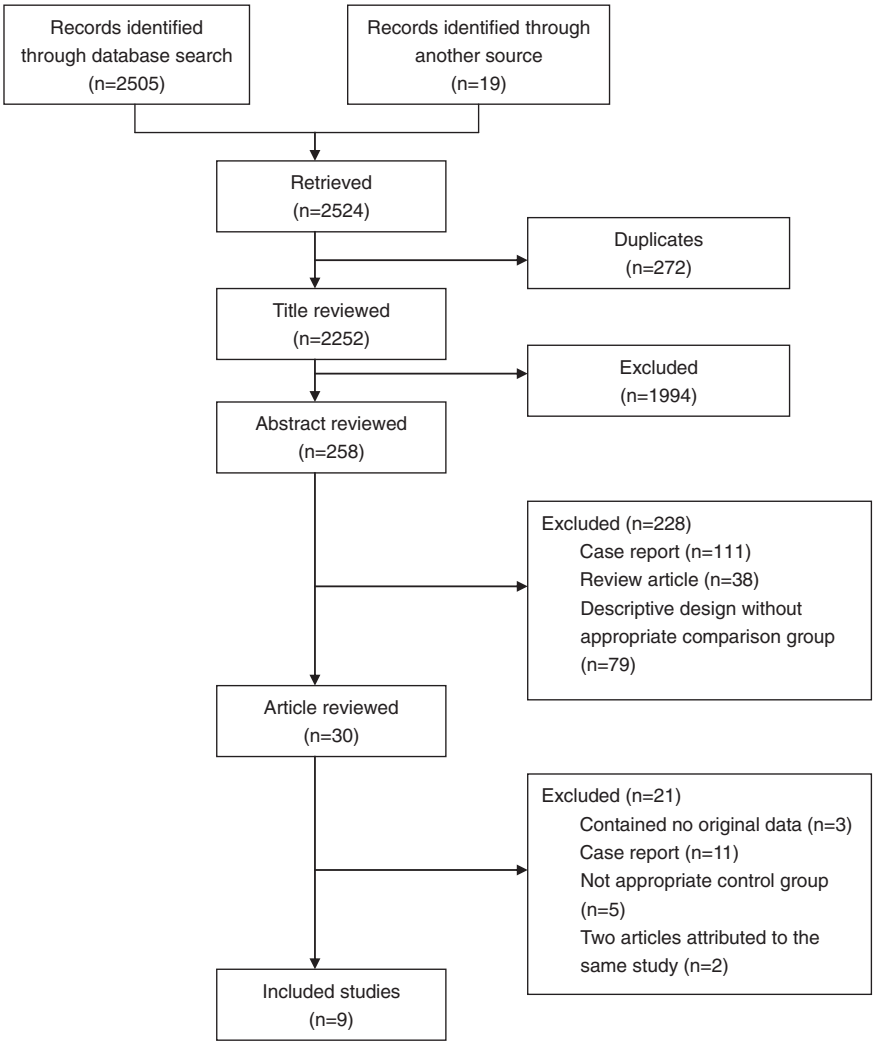

Fig. 1. Flow diagram of study selection for the systematic review.