Complications and recovery from laparoscopy-assisted vaginal hysterectomy compared with abdominal and vaginal hysterectomy

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Authors' objectives
To compare the complications, post-operative recovery time, and costs of laparoscopy-assisted vaginal hysterectomy, total abdominal hysterectomy (TAH) and vaginal hysterectomy.

Searching
The authors searched the electronic database of MEDLINE (1989 through September 1995) using the term 'laparoscopy-assisted vaginal hysterectomy'. Bibliographic references in retrieved studies were also checked for additional relevant publications. Non-English publications were excluded.

Study selection
Study designs of evaluations included in the review
Studies of laparoscopy-assisted vaginal hysterectomy which used the double-puncture technique and which described complications. Case reports, abstracts and letters were excluded.

Specific interventions included in the review
Laparoscopy-assisted vaginal hysterectomy, total abdominal hysterectomy (TAH) and vaginal hysterectomy.
Laparoscopy-assisted vaginal hysterectomy was classified into 5 types: type 0, use of the laparoscope for examination only; type 1, lysis of adhesions; type 2, ligation of the utero-ovarian or infundibulopelvic vessels; type 3, ligation of the uterine vessels; and type 4, laparoscopic dissection including cardinal and uterosacral ligaments.

The authors excluded studies of laparoscopy-assisted vaginal hysterectomy used for radical cancer treatment, sex-change operations, total laparoscopic procedures, or supra-cervical procedures.

Participants included in the review
Patients undergoing hysterectomy. Patients undergoing laparoscopy-assisted vaginal hysterectomy had a weighted grand mean age of 45 compared to a weighted grand mean age of 42 years for TAH. Body weight grand mean was 154 pounds for laparoscopy-assisted vaginal hysterectomy (23 studies reporting) and 165 for TAH (3 studies reporting). Weighted grand mean uterine weight for laparoscopy-assisted vaginal hysterectomy was 152 grams and 227 grams for TAH. Eleven studies included nulliparous women and ten studies included women who had previous Caesarean deliveries.

Outcomes assessed in the review
The outcomes assessed were:

1. Major complications (bladder injury, blood transfusions, bowel injury, fistula, ureteral trauma, pulmonary embolus, and sepsis).

2. Minor complications (urinary tract infection, epigastric vessel injury, cuff cellulitis, pelvic haematoma, respiratory infection, wound infection, and subcutaneous emphysema.

3. Operating time.

4. Pain relief requirements.

5. Return to work information.

6. Costs.
7. Conversion to open laparotomy for completion.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The authors do not state who, or how many of the reviewers, performed the data extraction. Data were extracted for the categories of: type of study, class of laparoscopic involvement indications for the procedure, uterine weights, antibiotic prophylaxis, concurrent procedures, operating room time, and hospital length of stay.

Methods of synthesis
How were the studies combined?
To calculate the overall percentage of complications, the instances of complications for each intervention was divided by the total number of patients from the included studies.

Chi-squared, Fisher exact, and t-tests were used to test for differences between outcomes for laparoscopy-assisted vaginal hysterectomy, TAH, and vaginal hysterectomy.

Operating room time, was reported as an average for all included studies with standard deviation (SD) and p-values.

Post-operative pain control, recovery and costs were reported in a narrative summary of the included studies that had reported data on these outcomes.

How were differences between studies investigated?
There was no formal investigation of homogeneity between the included studies. Differences in reporting are discussed in the text.

Results of the review
Thirty-four studies were included in the review. Two randomised trials, 28 retrospective studies, and 4 studies of unspecified designs were included (3112 laparoscopy-assisted vaginal hysterectomies, 1618 TAHs, and 690 vaginal hysterectomies).

Laparoscopy-assisted vaginal hysterectomy cases compared with TAH cases demonstrated significantly greater incidence of bladder injury (1.8% for laparoscopy-assisted vaginal hysterectomy versus 0.4% for TAH; \( p = 0.01 \)), significantly longer operating room time (115 minutes, SD 37 minutes, for laparoscopy-assisted vaginal hysterectomy versus 87 minutes, SD 18 minutes, for TAH; \( p < 0.001 \)), and significantly shorter hospitalisation (49 hours, SD 16 hours, for laparoscopy-assisted vaginal hysterectomy versus 79 hours, SD 20 hours, for TAH; \( p < 0.001 \)).

Use of analgesia was consistently less for laparoscopy-assisted vaginal hysterectomy and return to full activity was always sooner when compared to TAH.

Cost for the new procedure was higher in seven out of 11 studies, but when disposable instruments and hospital lengths of stay are considered, the remaining 4 studies reported a lower cost for laparoscopy-assisted vaginal hysterectomy.

Cost information
Cost favoured TAH overall. Laparoscopy-assisted vaginal hysterectomy was considered more expensive than TAH or vaginal hysterectomy by six of the eleven sources reporting operating room and hospital charges. Three sources
reported that TAH was more costly when disposable instruments were used for laparoscopy-assisted vaginal hysterectomy. Two sources reported that TAH was more expensive even when stapling devices and laser were included. One source reported that 52% of the cost of laparoscopy-assisted vaginal hysterectomy was attributable to disposable trocars and stapling devices. One further study showed a higher surgeon-based reimbursement for laparoscopy-assisted vaginal hysterectomy.

**Authors’ conclusions**
This systematic review suggests that compared with TAH, laparoscopy-assisted vaginal hysterectomy is associated with more complications, a shorter hospital stay and speedier postoperative recovery, less analgesia use, and higher costs. However, there is also a higher rate of bladder injury and lengthier surgery with laparoscopy-assisted vaginal hysterectomy. The lack of randomisation and adjustment for pre-operative risk status prevents one from drawing an inference regarding causal relationships. The authors state that in practice, the reported outcomes must be weighed when choosing an intervention.

**CRD commentary**
The authors have clearly stated their research question and their inclusion and exclusion criteria.

The literature search is quite limited and may have missed studies by focusing the search on only the MEDLINE database and because non-English publications were not sought.

The quality of the included studies was not assessed and the authors have not reported how the articles were selected, or how many of the reviewers were involved in the data extraction.

The data extraction is reported in tables and text and the authors have performed a statistical pooling of the included studies, however there is insufficient detail in the review to assess whether the data should have been pooled to get overall complication rates. The authors did not test for homogeneity.

The results should be viewed with caution because of the limitations of the review methods. The authors acknowledge that this review is weakened because of the heterogeneity of indications, the small sample sizes, and the absence of efforts to randomise patients into experimental and control groups.

**Implications of the review for practice and research**
Practice: The authors do not state any implications for practice.

Research: The authors state that further research on laparoscopy-assisted vaginal hysterectomy versus TAH is needed. They suggest that an RCT would need a sample size of at least 1,461 participants to detect a 50% increase in injuries based on a 4% incidence of combined major complications (one-tailed test, alpha = 0.05, 80% power), but that such a trial is unlikely to be feasible.

**Bibliographic details**
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