

TECHNOLOGY Subtotal vs total hysterectomy

Does the evidence support saving the cervix?

Research does not support claims that preservation of the cervix reduces sexual dysfunction, incontinence, or surgical complications.

"There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact."

Mark Twain, *Life on the Mississippi*

Thanks to the advent of minimally invasive, organ-preserving treatments such as endometrial ablation, progesterone-containing intrauterine delivery systems, and uterine fibroid embolization, today's patients suffer less morbidity and enjoy better outcomes for a number of procedures. To take advantage of the potential for

improved patient care, we try to use every new technology for every suitable candidate.

Hysterectomy is an obvious target. The number of hysterectomies performed has not declined substantially since these technologies were introduced, and persists at more than 550,000 per year in the United States. It is still the most widely performed major gynecological procedure.

Technological advances have made possible the use of laparoscopy to facilitate removal of the uterus without a major abdominal incision, with its inherent hazards. Many surgeons, seeking to make the most of new technology, have revisited laparoscopic subtotal hysterectomy, advocating preservation of the cervix to reduce surgical complications, sexual dysfunction, and pelvic-floor defects after hysterectomy.

New data, however—much of it released only in the last 12 to 18 months—tell us there is no difference in sexual function, pelvic floor support, or return to normal activities when the cervix is retained. What's more, leaving the cervix in place puts the

KEY POINTS

- Sexual function is not improved more with supracervical than with total hysterectomy.
- Operative morbidity for supracervical and total hysterectomy are similar.
- Pelvic-floor support and urinary incontinence do not seem to be improved with the supracervical approach.
- Cyclic bleeding occurs in 5% to 20% of women after supracervical hysterectomy.
- Reoperation rates for symptoms related to the retained cervix are significant—over 20% in the hands of highly skilled surgeons.

■ Dr. Levy is medical director, Women's Health Center, Franciscan Health System, Federal Way, Wash. She also serves on the OBG MANAGEMENT Board of Editors.

patient at greater risk of reoperation related to hysterectomy.

THEORY

Improved sexual function

EVIDENCE

Recent prospective analyses using validated measures of female sexual function have failed to demonstrate any advantage for supracervical hysterectomy.

Scientific study of sexual function is difficult at best. Many factors influence sexual behavior, and all must be considered when analyzing the effects of hysterectomy. To clearly understand the impact of hysterectomy on female sexual function, prospective studies in which women serve as their own controls provide the best quality evidence. That said, the contention that supracervical hysterectomy results in better sexual function than total hysterectomy stems from the research of a single group, which in 1983 retrospectively compared coital frequency, dyspareunia, libido, and orgasm after “supravaginal uterine amputation” with total hysterectomy.^{1,2}

Simple hysterectomy causes minimal disruption of Frankenhauser’s plexus of autonomic nerves.

They theorized that supracervical operation preserves Frankenhauser’s plexus of autonomic nerves, resulting in better sexual function. However, careful anatomic assessment of the nerve content in the ligaments supporting the uterus has since demonstrated that the rich nerve supply to the uterosacral and cardinal ligaments occurs in the lateral two thirds of these structures. Simple hysterectomy causes minimal disruption of these autonomic nerves, ganglia, and extensions of the inferior hypogastric plexus.³ **Thakar et al,**⁴ in a pivotal multicenter, double-blind, randomized trial conducted in the

United Kingdom, randomized 279 patients with benign disease to supracervical or total hysterectomy and followed them for 12 months. Surgical technique was standardized and the endocervix was coagulated in all patients.

The 2 groups were similar in measures of sexual function, including frequency of intercourse, orgasm, and rating of relationship with partner.

The Danish Hysterectomy Group⁵ randomized 319 patients with benign disease to total abdominal hysterectomy or subtotal abdominal hysterectomy, of whom 276 completed validated mailed questionnaires preoperatively, and at 2, 6, and 12 months postoperatively.

There was no change in sexual satisfaction in either group from their prehysterectomy levels. Overall quality of life improved significantly in both groups, in both mental and physical measures.

Roovers et al,⁶ in a multicenter, nonrandomized trial—powered well to detect 20% differences—compared vaginal hysterectomy, subtotal abdominal hysterectomy, and total abdominal hysterectomy (technique chosen by the surgeon).

Of the 379 patients recruited (from 13 teaching and nonteaching hospitals in the Netherlands) who had a male partner, 93% completed a validated questionnaire before and 6 months after surgery.

The questionnaire—used to assess sexual pleasure, activity, and problems—specifically addressed lubrication, orgasm, pain, and arousal on a 5-point scale (“not bothered” to “severely bothered”). Their findings:

- Sexual pleasure increased significantly in all groups regardless of type of hysterectomy.
- There was no difference in the incidence of bothersome sexual problems, but a significant number were reported: 43% after vaginal, 41% after subtotal, and 39% after total abdominal hysterectomy ($P = .88$).
- New sexual problems were reported in 9

patients (23%) after vaginal hysterectomy, 8 patients (24%) after subtotal hysterectomy, and 12 patients (19%) after total abdominal hysterectomy.

- There was a nonsignificant trend toward higher prevalence of arousal and lubrication problems after subtotal hysterectomy and total abdominal hysterectomy, compared with vaginal hysterectomy.

THEORY

Improved pelvic floor support, less incontinence

EVIDENCE

Pelvic floor support and urinary incontinence do not seem to be improved with the supracervical approach.

Proponents of supracervical hysterectomy argue that preservation of the cardinal and uterosacral ligaments will reduce the incidence of apical prolapse. In addition, maintenance of the pubocervical ring should lead to less posthysterectomy urinary incontinence.

Our newfound understanding that the nerves are, for the most part, spared at simple hysterectomy should argue against allegations that bowel and urinary function are better preserved by retaining the cervix.

Clearly, long-term outcome studies are required to assess these issues. The randomized trials thus far comparing supracervical with total hysterectomy have not followed patients beyond 2 years.

Nevertheless, at 12 to 24 months, published trials^{5,7} report an increased incidence of urinary incontinence in patients randomized to supracervical hysterectomy. Prolapse was also reported in a larger number of the patients undergoing subtotal as compared with total hysterectomy (1 to 2% versus 0% at 12 months).

The Total or Supracervical Hysterectomy (TOSH) Research Group⁷ conducted a multicenter randomized trial with a diverse patient

population (78% of women were African American). From January 1998 through April 2000, 135 patients at 4 centers were randomized to supracervical hysterectomy or total abdominal hysterectomy. All patients had benign disease. Surgical technique varied by surgeon as in the general community. Patients and researchers were not blinded as to the technique performed. Subjects were followed for 2 years.

Women undergoing supracervical hysterectomy had a greater incidence of urinary incontinence after surgery.

Both techniques resulted in significant decreases in complaints of urinary incontinence and voiding dysfunction

The Danish Hysterectomy Group⁵ found that patients who had supracervical hysterectomies had a statistically greater incidence of urinary incontinence after surgery than those undergoing total abdominal hysterectomy (18% versus 9% $P = .04$). The incidence of new incontinence symptoms was 2.1% in the total abdominal hysterectomy group compared with 7.6% in the subtotal group. There was no change in bowel function in either group.

Thakar et al⁶ found urinary frequency declined significantly in both groups.

THEORY

Fewer injuries and complications, less blood loss

EVIDENCE

Randomized trials have offered no evidence to support a reduction in complication rates or bleeding requiring transfusion.

Since the creation of a bladder flap and division of the cardinal ligaments is not required in supracervical hysterectomy, we might theoretically expect to see reduced

rates of injury to the ureters and bladder. Without the need for colpotomy, blood loss should also be reduced.

Cyclic bleeding may occur after supracervical hysterectomy even when residual endocervical tissue is cored or coagulated.

Given the low incidence of these complications at total hysterectomy, however, a meta-analysis of published randomized trials would be required to properly evaluate this issue. Thus far, randomized trials have offered no evidence to support a reduction in complication rates or bleeding requiring transfusion.

Thakar et al⁴ found a significant reduction in operating time as well as a reduction in blood

loss (422 mL versus 320 mL) for the supracervical group compared with the total hysterectomy group; however there were no differences in the need for transfusion (5% in each group).

Women who underwent total abdominal hysterectomy had a higher incidence of fever while in the hospital (27% versus 10%), but there was no difference in the rate of infectious morbidity.

Within 1 year of discharge, more patients undergoing supracervical hysterectomy experienced complications: 7% had cyclic bleeding; 2% had cervical prolapse.

The TOSH Research Group⁷ found no difference in the rate of complications, activity limitations, or symptom improvement between groups. During the first 3 months, there was no difference in missed work, restricting

activities, or bed rest. Both techniques resulted in significant decreases in complaints of pelvic pain, pressure, and back pain.

Of women undergoing supracervical hysterectomy, 5% had cyclic vaginal bleeding (only half of the patients in this series had the endocervix ablated).

Further, there were more readmissions related to the hysterectomy in the supracervical group, though this was not statistically significant (relative risk 1.99; 95% confidence interval, 0.58 to 6.8).

Twenty percent of women in the **Danish Hysterectomy Group study⁸** had persistent vaginal bleeding after subtotal hysterectomy; 2 went on to have trachelectomy for cyclic bleeding.

Prolapse of the cervical stump occurred in 3/136

CONTINUED

LightMat®

Cool Light

Improves visibility in the surgical site.
Attaches to retractors for deep vaginal and abdominal surgery.
Contact Lumitex for an evaluation!

LightMat® from Lumitex:

- Cool, bright, shadow-free lighting
- Flexible/malleable, fits most retractors
- Improves visibility in deep cavities
- Standard and Thin versions available
- New *Ultra-Thin* version available

LightMat®
SURGICAL ILLUMINATOR
by Lumitex®

Strongsville, OH, USA
800-969-5483
Web: www.LightMat.com

A snapshot of key trials: Total vs subtotal hysterectomy

Outcomes after total versus subtotal abdominal hysterectomy. Thakar R, et al. *N Engl J Med.* 2002;347:1318–1325.⁴ *Level I evidence*

CONCLUSION Neither subtotal nor total abdominal hysterectomy adversely affected pelvic organ function at 12 months. Subtotal abdominal hysterectomy resulted in more rapid recovery and fewer short-term complications but infrequently caused cyclical bleeding or cervical prolapse.

- Pivotal multicenter, double-blind, randomized trial conducted in the United Kingdom.
- Randomized 279 patients with benign disease to supracervical or total hysterectomy and followed them for 12 months.
- Surgical technique was standardized and the endocervix coagulated in all patients.

Randomized controlled trial of total compared with subtotal hysterectomy with 1-year follow-up results. The Danish Hysterectomy Group. *Br J Obstet Gynaecol.* 2003;110:1088–1098.⁵ *Level I evidence*

CONCLUSION A smaller proportion of women suffered from urinary incontinence after total abdominal hysterectomy than after subtotal abdominal hysterectomy 1 year postoperatively.

- Multicenter, unblinded randomized trial conducted in Denmark.
- Randomized 319 patients with benign disease to total abdominal hysterectomy or subtotal abdominal hysterectomy, of whom 276 completed validated mailed questionnaires preoperatively, and at 2, 6, and 12 months postoperatively.

Hysterectomy and sexual well being: Prospective observational study of vaginal hysterectomy, subtotal abdominal hysterectomy, and total abdominal hysterectomy. Roovers JP, et al. *Br Med J.* 2003;327:774–779.⁶ *Level II-1 evidence*

CONCLUSION Sexual pleasure improved after vaginal hysterectomy, subtotal abdominal hysterectomy, and total abdominal hysterectomy. The persistence and development of bothersome problems during sexual activity were similar for all 3 techniques.

- Multicenter, nonrandomized trial conducted in the Netherlands.
- Investigated sexual function only.
- Compared vaginal, subtotal abdominal, and total abdominal hysterectomy (technique chosen by the surgeon).
- Of the 379 patients with a male partner, 93% completed a validated questionnaire before and 6 months after surgery.

A randomized comparison of total or supracervical hysterectomy: Surgical complications and clinical outcomes. Total or Supracervical Hysterectomy Research Group. *Obstet Gynecol.* 2003;102:453–462.⁷ *Level I evidence*

CONCLUSION We found no statistically significant differences between supracervical hysterectomy and total abdominal hysterectomy in surgical complications and clinical outcomes during 2 years of follow-up.

- Multicenter, unblinded randomized trial conducted in the United States.
- Randomized 135 patients with benign disease to supracervical hysterectomy or total abdominal hysterectomy and followed them for 2 years.
- Surgical technique varied by surgeon as in the general community.
- Only half of the patients had the endocervix ablated.

Long term outcome following laparoscopic supracervical hysterectomy. Okaro EO, et al. *Br J Obstet Gynecol.* 2001;108:1017–1020.⁸ *Level II-3 evidence*

CONCLUSION Symptoms related to the cervical stump requiring further surgery frequently occur following a laparoscopic supracervical hysterectomy.

- Retrospective analysis of case records for 70 patients.
- All subjects were women who would have otherwise undergone abdominal hysterectomy, but agreed to laparoscopic supracervical hysterectomy.
- All surgeries were performed by the same surgeon.

patients after subtotal hysterectomy, versus no prolapse after total abdominal hysterectomy.

Long-term outcomes: The downside

For a mean of 66 months (range: 4 to 7 years), Okaro et al⁸ followed 70 patients undergoing laparoscopic supracervical hysterectomy by a single, highly skilled laparoscopic surgeon.

Their findings point out the downside of cervical preservation. Although all patients had the endocervical canal and transition zone cored out, over 24% reported symptoms related to the cervical stump—and all required further surgery. Further, cyclic vaginal bleeding occurred in 11% of women.

One patient developed cervical intraepithelial neoplasia. Dyspareunia and pelvic pain were significant complaints in 19% of the patients. (These women were more likely to have had hysterectomy for endometriosis.) Sixteen of the 17 patients with cervical complaints required trachelectomy within the follow-up time period.

"How empty is theory in the presence of fact!"

Mark Twain, *A Connecticut Yankee in King Arthur's Court*

Practice recommendations

We, as clinicians, must accumulate evidence from basic science as well as clinical research, put it all together, and make recommendations based on these data. The data, tell us, in fact, that there is no difference in sexual dysfunction, pelvic floor support, or return to normal activity levels when the cervix is retained, and no evidence to support an advantage to supracervical hysterectomy.

My recommendation is for vaginal hysterectomy when possible. The theoretical advantages of retention of the cervix have driven many clinicians to abandon the vaginal approach in favor of laparoscopic supracervical hysterectomy; no data support this theory.

While not the focus of this article, ample data tell us that the vaginal approach, when

technically feasible, is less invasive and carries fewer risks for our patients than laparoscopic or abdominal hysterectomy, and permits excellent access for support of the pelvic floor. I do think that patients who truly believe that their sex lives will be ruined after total hysterectomy or that they will do dramatically better if the cervix remains, may experience this self-fulfilling prophecy.

What I tell patients. I carefully review all the facts with patients in helping them select the appropriate surgical procedure.

I tell patients:

- That overwhelming evidence suggests that sexual function improves in the vast majority of women after hysterectomy, whether or not the cervix is left.
- That there is a real possibility that cyclic bleeding may occur after supracervical hysterectomy, even when the residual endocervical tissue is cored or coagulated. I stress this point to all women who elect hysterectomy.
- That randomized trials demonstrate a significant incidence of reoperation for persistent bleeding. ■

REFERENCES

1. Kikku P. Supravaginal uterine amputation vs. hysterectomy: effects on coital frequency and dyspareunia. *Acta Obstet Gynecol Scand.* 1983;63:141–145.
2. Kikku, Gronroos M, Hirvonen T, et al. Supravaginal uterine amputation vs. hysterectomy: effect on libido and orgasm. *Acta Obstet Gynecol Scand.* 1983;62:147–152.
3. Butler-Manuel SA, Buttery LD, AHern RP et al. Pelvic nerve plexus trauma at radical hysterectomy and simple hysterectomy: the nerve content of the uterine supporting ligaments. *Cancer.* 2000;89:834–841.
4. Thakar R, Ayers S, Clarkson P, et al. Outcomes after total versus subtotal abdominal hysterectomy. *N Engl J Med.* 2002;347:1318–1325.
5. Gimbel H, Zobbe V, Andersen BM, et al. Randomized controlled trial of total compared with subtotal hysterectomy with 1-year follow-up results. *Br J Obstet Gynaecol.* 2003;110:1088–1098.
6. Roovers JP, van der Bom JG, van der Vaart CH, et al. Hysterectomy and sexual wellbeing: prospective observational study of vaginal hysterectomy, subtotal abdominal hysterectomy, and total abdominal hysterectomy. *Br Med J.* 2003;327:774–779.
7. Learman LA, Summitt RL Jr, Varner RE, et al. A randomized comparison of total or supracervical hysterectomy: surgical complications and clinical outcomes. *Obstet Gynecol.* 2003;102:453–462.
8. Okaro EO, Jones KD, Sutton C. Long term outcome following laparoscopic supracervical hysterectomy. *Br J Obstet Gynecol.* 2001;108:1017–1020.

The author serves on the Speakers Bureaus for Barr, Berlex, and Wyeth-Ayerst.