Hysterectomy for Chronic Pelvic Pain

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KEYWORDS

• Hysterectomy • Chronic pelvic pain • Surgical treatment
• Perioperative management

KEY POINTS

- Hysterectomy for chronic pelvic pain (CPP) is likely most effective when symptoms are linked to menstrual pain, menstrual activity, and a reproducibly tender uterus on examination.
- Patients with CPP are more likely to have chronic overlapping pain conditions (COPCs) and to require multi-modal therapies for optimal results. These conditions do not preclude hysterectomy as a treatment of targeted symptoms.
- The few available studies of hysterectomy report favorable outcomes for pelvic pain in well selected patients, with only 5% to 26% of cases failing to result in significant or complete improvement. However, 38% of patients without pathologic abnormalities reported persistent pelvic pain after 12 months in one study.
- Identifying COPCs and psychological risk factors for chronic pain can inform perioperative management with the goal to improve short-term recovery and decrease risk of persistent pain after hysterectomy.

INTRODUCTION

Chronic pelvic pain (CPP) has an estimated prevalence of 15% in the adult female population of the US and has been estimated to be the primary reason for 4% to 12% of all hysterectomies for benign indications.[1–3] More recent and specific data are not available from epidemiologic studies because CPP is poorly captured by administrative claims data and due to lack of a singular, widely used definition of CPP, which continues to be debated.[4]

Several clinical practice guidelines have addressed surgical management options for CPP.[5] The level and grade of evidence cited varies, but most recommend hysterectomy for severe or refractory symptoms. The 2020 clinical guideline by the American

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College of Obstetricians and Gynecologists (ACOG) on the evaluation and management of CPP does not address the efficacy, effectiveness, or best practices for hysterectomy.[6] However, this major surgery remains an important option even as cases annually are overall decreasing due to improved conservative management for leiomyomas and endometriosis.

In this narrative review, we examine 4 essential issues for the gynecologic surgeon considering hysterectomy for a patient with CPP:

1. Conceptual framework underlying hysterectomy as a treatment modality for patients with CPP;
2. Long-term outcomes demonstrating the efficacy of hysterectomy for patients with CPP;
3. Optimizing individualized benefits and risks of surgery through preoperative assessment and counseling; and
4. Perioperative care for the patient undergoing hysterectomy for CPP.

DISCUSSION

Section 1: conceptual framework

For the practicing clinician, we lead with an overarching view of this topic. Based on our clinical experience and read of the literature, hysterectomy for CPP is likely most effective, with durable results, when there is clearly a major component of the patient's symptoms linked to menstrual pain or menstrual activity. Further, hysterectomy is likely to be successful if the dominant feature of the evaluation is a reproducibly tender uterus on pelvic examination.

Some clinicians do not count leiomyoma, advanced endometriosis, or diffuse adenomyosis as CPP conditions when these are the dominant source of pain. When presenting in isolation, these conditions seem to respond well to hysterectomy. In our experience, we have similar success in hysterectomy for chronic uterine pain without visible pathology following persistently symptomatic dysmenorrhea or following acute uterine irritation (eg, intrauterine device insertion, endometrial ablation with or without tubal sterilization, pelvic inflammatory disease). These specific etiologies have not been covered in published CPP hysterectomy case series and observational cohorts.[7] Consistent success for symptom relief of chronic uterine pain is less predictable if:

- Only minor uterine pathology is present (eg, incidental small leiomyoma, random islands of adenomyosis)
- Tenderness on examination poorly or incompletely reproduces the primary pain symptoms
- Minimal dysmenorrhea is present
- Multiple chronic overlapping pain conditions (COPCs) are present (eg, IBS, bladder pain syndrome [BPS]/interstitial cystitis [IC])
- Pain is widespread throughout the abdomen and pelvis
- Psychological comorbidity such as depression significantly impairs quality of life
- Central sensory sensitivity is evident by clinical assessment or as measured by scales such as the Fibromyalgia Survey Score (FSS)

The presence of multiple COPCs in a woman presenting with CPP should raise concerns for a gynecologist that separate from any peripheral pelvic pathology, she may also have dysregulations in central nervous system pathways involved in threat appraisal. This neurocognitive processing dysfunction leads to the abnormal interpretation of peripheral afferent signaling from abdominopelvic tissues (eg, bladder,

bowel, pelvic floor) that may not readily resolve with removal of the uterus.[8,9] The underlying mechanisms may include alterations in the activity of spinal interneurons, connections between different cortical centers, and impaired descending modulation.[10] On the other hand, pain symptoms may also be exacerbated by cross-organ sensitization, a well-known process underlying some CPP cases.

In particular, severe undertreated dysmenorrhea at menarche seems to predispose patients to developing CPP outside the uterus. Some women with that history may find further resolution of bowel or bladder complaints after their hysterectomy as an unexpected side benefit. As a corollary to this concept, postoperative recovery must be well managed for patients with multiple COPCs so that a new potential pain generator does not emerge, either a discrete organ-based syndrome or chronic postsurgical pain. For patients with a mixed presentation of chronic pain conditions, predicting who will have a significant improvement after hysterectomy remains a critical research question.

Section 2: Long-Term Outcomes

Measurement of the efficacy of hysterectomy for CPP has long been plagued by ambiguous research definitions. Most studies have not carefully defined patients with preoperative pelvic pain with the same criteria used for CPP. Comparisons between studies have been further limited by heterogenous data on postoperative outcomes: persistent pelvic pain (undefined), persistent CPP, chronic postsurgical pain, functional outcomes (eg, return to normal activity, sexual activity, and bladder and bowel function), and need for additional surgery.[11]

Early studies on persistent chronic pelvic pain

The literature on the effectiveness of hysterectomy for CPP conditions has largely come from smaller, single-site, observational studies. In 1990, Stovall and colleagues published the first data on long-term outcomes: a retrospective case-control study of 99 patients undergoing hysterectomy for presumed uterine etiology for CPP (with exclusions for extrauterine disease and uterine weight >200g at the time of surgery).[12] Nearly all women reported dysmenorrhea (94%) and had uterine tenderness (97%). Resolution of pain occurred in 78% (77/99) women at an average of 21.6 months of follow-up. Of the remainder, 17 patients reported partial improvement, and 5 patients reported worse pain than before surgery. Details on the character or etiology of persistent CPP were not mentioned. Differences in symptomatology, hysterectomy route, concomitant procedures, or uterine pathology did not predict the success of surgery. On pathologic review, 66% of patients had a normal uterus.

In 1995, Hillis and colleagues published the first multi-center prospective observational cohort study on persistent CPP after total abdominal hysterectomy.[13] Among 308 women with CPP as the primary indication for hysterectomy, 74% of patients reported complete resolution of pain at 1-year follow-up and 21% reported persistent but decreased pain. Consistent with the prior study, 5% of patients reported no change or worsening pain. Though an absence of identifiable pelvic pathology doubled the odds of persistent CPP, 62% of patients in this subgroup were pain-free 1 year after surgery.

Variable but favorable pain responses have been described in 2 earlier studies. Carlson and colleagues reported some degree of continued preoperative pelvic pain in 5% (14/273) of patients at 1 year of follow-up.[14] In a cross-sectional study of women with a primary surgical indication of pelvic pain, Tay and Bromwich found that 96% (94/98) of women at 1 year following total abdominal hysterectomy had partial (18%) or complete (78%) improvement.[15]

Persistent chronic pelvic pain and neuropsychological factors

More recent work has extended these initial outcome measures to understand what other psychological or neurologic factors may predict clinical response to hysterectomy, as these are core aspects of chronic pain syndromes. The challenge with those studies is the inclusion of heterogeneous populations of patients without all having a consistent formal diagnosis for CPP.

Regarding the presence of comorbid depression, Hartmann and colleagues in 2004 studied 1249 women from the Maryland Hysterectomy multisite study to characterize how depression and preoperative pain levels predict postoperative persistent CPP and functional outcomes.[16] While 32% of women met their criteria for CPP (moderate to severe levels for 14 days in the last month), only 1% had pain as the primary indication for hysterectomy.

In that study, having preoperative pelvic pain incurred a 2.22 higher odds of reporting a pelvic pain problem at 24 months, while having comorbid depression and pelvic pain had a 4.91 increased odds. However, the absolute reduction in reported pelvic pain was striking—with reductions in those 2 groups from 95% to 97% preoperatively to only 9% to 19% at 24 months postoperatively. Similarly, large improvements in physical and mental health (using the Medical Outcome Study Short-Form General Health Survey) were seen following hysterectomy even among the self-identified pelvic pain patients.

As a well-established feature of chronic pain syndromes, central sensory sensitivity is a known risk factor for higher use of opioids postoperatively and for the development of new-onset chronic postsurgical pain. A study published in 2021 by As-Sanie et al. assessed the impact of broad central sensory sensitivity (using the 31 point Fibromyalgia Survey Scale [FSS]) on persistent pelvic pain at 6 months after hysterectomy.[17] Out of 126 women studied, 24% had CPP as an indication for hysterectomy, and review of pathology and operative reports indicated a heterogeneous group: 51% leiomyoma, 46% adenomyosis, 15% endometriosis. These women reported a substantial baseline average pelvic pain, which was not significantly different between those without persistent pelvic pain compared with those with persistent pelvic pain (5.3/10 vs 6.1/10, $P = 10$). Most women (111/126%, 88%) achieved the primary specified outcome: at least a 50% improvement from baseline pelvic pain. Among the 15 (12%) cases defined as failures, only 5 (4%) women reported persistent or worsening pain.

In a multivariable regression model, baseline central sensory sensitivity profile significantly predicted the likelihood of persistent pelvic pain status (OR: 1.27 [95% CI: 1.03–1.58], for each point increase on FSS) and absolute pain score. However, 95% of women in the highest FSS tertile still managed to achieve a pelvic pain score less than or equal to 1.8/10 at 6 months. This remarkable improvement in a group at high risk for persistent pain supported the main conclusions by the study authors. Central sensory sensitivity and other risk factors should not limit the potential benefit of hysterectomy to treat a peripheral pain generator as identified by history and examination, Instead, assessments like the FSS can be used to inform counseling on postoperative outcomes and planning for additional perioperative management strategies that target central sensory sensitivity (examples reviewed later in this article). In contrast to the prior literature, depression, anxiety, severity and duration of preoperative pain, history of endometriosis, or hysterectomy route (almost all laparoscopic or vaginal) were not associated with postoperative outcomes in the combined predictive model.

Collectively, both studies, one done in a broad community setting by Hartmann and colleagues, and one done in a tertiary pelvic pain referral clinic setting by As-Sanie

et al., suggest that despite comorbid psychological issues or sensory sensitivity, a large proportion of patients with baseline CPP will achieve significant relief from hysterectomy. Future studies would benefit from a careful appraisal of how clinical examination findings might help predict the potential benefit of hysterectomy.

Section 3: Optimizing Individualized Benefits and Risks of Surgery

Predicting success: history, examination, and imaging

The easier recovery from the widely used laparoscopic approach may bias women and their clinicians to view hysterectomy as the panacea for nonspecific pelvic pain. To inform proper preoperative assessment, case selection, and counseling, clinicians should perform a targeted history, careful examination, and ordering/review of imaging.

We cannot overemphasize the importance of exploring a patient's general history of pain before focusing on reproductive organs and tissues. Intuitively, severe midline pain largely resembling symptoms of dysmenorrhea, but throughout the month, is more likely to reflect a primary uterine source of pain compared with noncyclic pain of another location or character. In contrast, identifying symptoms suggestive of IBS, BPS/ IC, myofascial pelvic pain (MPP), or a broad swath of COPCs may reduce the potential for hysterectomy to effectively treat pelvic pain.

Awareness of prior trauma experiences, which are present in over 40% of women with CPP in tertiary referral clinics,[18] will also help prepare the patient for the possibility of a more complex pain response postoperatively, or of having latent chronic pain conditions unmasked. Understanding which analgesics and adjuvant medications (eg, neuromodulators) have been effective previously, location of prior pathology, and prior surgical approaches used may minimize intraoperative complications and poor postoperative pain control. A patient desiring future fertility will naturally not be a candidate for hysterectomy, but a small minority of nulliparous women with recalcitrant symptoms may nonetheless opt for this approach.

We use a systematic approach to the physical examination for all patients with CPP regardless of where they are in the therapeutic journey. Because symptoms of COPCs may wax and wane over time, the examination should be repeated preoperatively to confirm the uterus remains tender and to account for any meaningful untreated pain generators. There are also obvious features such as focal symptoms that will suggest the value of precise examination maneuvers to detect the presence of deep infiltrating endometriosis or nerve entrapment. These conditions are important to consider, as they might respond sufficiently to conservative therapy. As part of a standardized and comprehensive examination (similar to one reported by Abu-Alnadi et al.[19]), we recommend special attention to the following:

- Abdominal wall: inspection for prior surgical scars as sites of possible nerve injury
- Abdominal wall: Carnett's sign to aid in differentiating pain from the abdominal wall and viscera or other internal pain
- Single-digit vaginal examination: palpate Alcock's canal to identify pudendal neuropathy
- Single-digit vaginal examination: assess muscles (eg, levator ani, obturator internus) for tone and tenderness—noting if palpation recreates the primary pain complaint, dyspareunia, or neither
- Bimanual examination (preferably with a single internally inserted digit): gentle palpation of the urogenital structures, rectovaginal septum, uterosacral ligaments, uterus, and adnexa—noting any restriction in mobility and attempting to isolate sensitivity of adjacent structures

Separate from hysterectomy planning, preoperative evaluation of the patient with CPP mandates imaging, typically a pelvic ultrasound. This information is generally available ahead of any counseling about surgical success rates. Diagnosis of uterine pathology (eg, leiomyoma, adenomyoma, adenomyosis) can complement examination findings for the attribution of chronic pain to a distinct, focal source; however, most definitions of CPP typically exclude the diagnosis of a structural abnormality as the root cause. Separately, imaging may detect a nonuterine cause of pelvic pain that might not respond to hysterectomy alone, such as deep infiltrating endometriosis in the rectovaginal septum or occult adnexal pathology that might need preoperative evaluation.

One other imaging consideration is pelvic venography, which has been suggested to evaluate for the incompetence of the pelvic veins promoting blood flow stasis, inflammation, and nerve activation—known as pelvic congestion syndrome. The diagnostic accuracy of such studies has never been carefully studied, and findings of enlarged ovarian veins, varicosities, or delayed venous return can be found in significant numbers of asymptomatic women. Moreover, the symptom complex and physical examination findings purported to define this syndrome also have never been validated. Nonetheless, in one small RCT, women meeting the criteria for pelvic congestion syndrome reported a significant improvement in pain after hysterectomy and bilateral salpingo-oophorectomy.[20]

Preoperative counseling for patients with chronic overlapping pain conditions

Each CPP case with a uterine pain component will present somewhat uniquely. Some patients are conveniently present with comorbid gynecologic symptoms or an antecedent history that may more predictably respond to hysterectomy: midline pelvic pain with abnormal uterine bleeding, postablation syndrome, or chronic gynecologic infections. Other presentations without specific gynecologic symptoms (eg, pelvic pain without concomitant menstrual bleeding issues or bulk symptoms, isolated deep dyspareunia without any evidence of pain on uterine or forniceal palpation, intermittent cramping with concurrent bowel dysfunction) require a caveat that their symptoms may not originate from the uterus even if the patient is convinced of its source. Complete details of symptomatology have not been captured in prior studies, so the frequency of these pain characteristics remains unknown.

We counsel patients that there is Level III evidence of high rates of persistent pain relief for endometriosis-associated pelvic pain without (77%) or with bilateral oophorectomy (92%) based on a case series by Shakiba and colleagues with 7 years of follow-up (n = 97 women).[21] Coexisting deep infiltrating endometriosis should be targeted at the same time, based on symptoms; however, not all cases of bowel endometriosis need excision, which again should be driven by the exact examination findings, particularly if the patient is interested in hormonal suppression postoperatively or if she is near menopause.

However, a patient who also reports prolonged, severe MPP or BPS/IC, will likely still follow the uncertain trajectory of those extrauterine conditions and require targeted therapy for those organs. For example, Chung and colleagues reported a case series of 111 women with CPP after hysterectomy whereby 79% were diagnosed with BPS/IC.[22] This cohort is illustrative of the challenge in treating CPP, as only a minority had improvement in pain with recommended therapies. Similar caveats should be given for severe midcycle pain or IBS. Patients with fibromyalgia or diffuse pain are a special case, and we strongly advise engagement in inter-disciplinary and multimodal care before surgery if possible.

Abu-Alnadi et al. have recently reported the first study to assess the prevalence of MPP before laparoscopic hysterectomy including those with and without CPP.[19] MPP was identified on standardized preoperative examination of the pelvic floor in 151/353 (43%) women, notably at a CPP referral center. It was strongly correlated with other chronic pain conditions (eg, low back pain, fibromyalgia) and worse short-term postoperative pain: 37% of patients with MPP reported pain of 5/10 or greater at 3 to 6 weeks compared with 1% of patients without MPP. In our practice, we advise patients with abdominal and pelvic myofascial pain that they may experience increased pain in the immediate postoperative period and offer pelvic floor physical therapy referral and muscle relaxants for use before and after surgery. Similar system-focused management should be considered for other COPCs previously discussed.

Risks of surgery

Patients requesting hysterectomy for CPP treatment may be quite familiar with surgical recovery and risks, but a thorough review of those prior experiences and anticipated complications can optimize recovery and satisfaction. Because many of these patients will have CNS alterations consistent with central sensory sensitivity, it is important to look for and treat complications early. For example, suspected nerve entrapment, whether from abdominal wall or pelvic nerves if a deeper dissection or sacrospinous suspension is performed, respectively, deserves early treatment efforts with nerve injections, physical therapy, or early consideration of removal of sutures if the pain does not steadily improve . We also counsel patients about the rare complication of new vaginal cuff pain, which may poorly respond to medical and surgical interventions.[23]

The actual risk of *de novo* posthysterectomy pain is not well characterized in most prior studies as many hysterectomy patients have preoperative pain, even if CPP is not the indication for surgery. A large Danish study estimated chronic postsurgical pain occurs in up to 32% of patients, and a smaller prospective follow-up study suggested perhaps half of those women have some degree of significant pain.[3,24] Benolo and colleagues reported a recent prospective cohort at 12 weeks postoperatively whereby 32% of patients reported any pain, but only 6% reported moderate to severe pain (4/10 or greater).[25]

Finally, as CPP is typically a condition of reproductive age women, women should be counseled about the risk of regret from hysterectomy, which has a durable 1-year estimate of about 7% based on the Detroit Hysterectomy Regret study.[26] The predictor of such regret primarily was lack of initial satisfaction with the decision to have this surgery, supporting the need to elicit patient engagement thoroughly in such planning.

Concurrent procedures

Perhaps the most important surgical planning question for hysterectomy for patients with CPP is whether to conserve the ovaries. In our experience, a well-counseled, premenopausal patient with CPP will almost always opt for retention even when advised about the 13% higher reoperation risk over 7 years for endometriosis-associated pelvic pain.[21] The known reduction in lifespan with early oophorectomy without hormone replacement (especially before age 40–45) and the concerns about small risks of hormone replacement therapy (eg, acute side effects, venous thromboembolism) seem to be strong drivers of that preference.[27] Notably, reoperation for oophorectomy has been shown to improve pelvic pain at short-term follow-up in 60% of carefully selected patients but with complication rates similar to laparoscopic hysterectomy.[28] If there is strong concern that the ovaries may be scarred down and cause recurrence of pain

due to severe cul-de-sac disease, one option is to consider an oophoropexy with permanent suture up to the side wall.

If oophorectomy is planned, careful attention is needed to avoid leaving a remnant behind that may cause persistent CPP. Behera and colleagues reported on a case series (n = 124 women) with CPP after hysterectomy and bilateral salpingo-oophorectomy who underwent laparoscopic evaluation.[29] The most common indications for the index surgery were endometriosis (45%) and CPP (20%), and the most prevalent findings at subsequent laparoscopy were adhesions (94%), endometriosis (15%), and ovarian remnants (26%). Concurrent ovarian remnant and endometriosis were found in 10 (8%) patients. For women found to have ovarian remnant syndrome, 70% reported improvement postoperatively, highlighting the importance of prevention through excellent surgical technique at the index surgery. When the ovaries are adherent to the side wall, additional preventative steps may include ureterolysis and ensuring an adequate margin in excision of peritoneum and transection of the infundibulopelvic ligament.

As previously discussed, deeply infiltrating endometriosis should be addressed if it can be reasonably linked to the symptom presentation. However, in our experience, old fibrosis in the side wall does not necessitate a broad peritonectomy in search of "complete excision" when the primary indication is the treatment of uterine pain (by examination and symptoms).

Section 4: Perioperative Care

Once the decision for hysterectomy is made, there are numerous opportunities to improve the patient's perioperative experience and surgical outcomes. A comprehensive review of Enhanced Recovery After Surgery (ERAS) protocols has been recently published in a white paper from the AAGL.[30] Urinary retention, nausea, and uncontrolled pain are the most significant barriers to achieving same-day discharge in medically healthy patients.[31] Accordingly, patients with CPP often have multiple risk factors for failed same-day discharge. Setting expectations may be the most important and modifiable, albeit challenging, step in optimizing postoperative recovery for patients with CPP. We highlight key considerations for patients with CPP from ERAS components and evidence from the broader chronic pain literature.

Preoperative opioid, opioid agonist/antagonist, benzodiazepine, and substance use

For patient's using chronic opioids under a pain contract, we recommend contacting that provider directly to confirm the plan for multi-modal perioperative pain management and to establish who will prescribe postoperative opioids. Additional opioids should be prescribed above preoperative levels. It may be helpful for the patient to complete an anesthesiology preoperative visit to discuss options like ketamine or lidocaine infusions, or regional anesthesia. These have not been shown to improve pain and recovery outcomes in the general laparoscopic hysterectomy population, but studies have not specifically assessed patients with CPP.[30] At our institution, we recommend an opioid taper (eg, goal of 20 morphine milligram equivalents [MME] per day) 1 to 2 weeks before surgery in an effort to improve postoperative response to opioids. However, this is not recommended by some others.[30]

For patients with baseline benzodiazepine, alcohol, or other drug use, careful instruction should be provided on risks of severe sedation or respiratory depression. Cessation of tobacco and heavy alcohol use at least 4 weeks before surgery is recommended.[30] Many organizations recommend prescribing naloxone for patients using concomitant opioids and benzodiazepines or high dose opioids alone (>50 MME

per day).[32] We also warn patients using both opioids and gabapentinoids, an important class of adjuvant medications for patients with chronic pain, that increased side effects including respiratory depression have been reported.

Postoperative care for patients with chronic pain

Patients with chronic pain experience higher levels of postoperative pain after hysterectomy and have a decreased response to analgesics.[33] Catastrophizing and other psychological risk factors such as anxiety and depression may contribute to this relationship. Ideally, patients with these risk factors would engage with an interdisciplinary treatment team before hysterectomy, including a therapist experienced with chronic pain. Laying this groundwork for patients experiencing acute postoperative pain is challenging, but focused interventions may be translatable for the perioperative team (eg, surgeon, nursing, primary care provider).

Postoperative outcomes may be improved through nonpharmacological interventions including physical, psychological, or both.[34] Depending on the case and timeline to surgery, these options may be initiated pre or postoperatively. For example, pelvic floor physical therapy may improve myofascial hypertonicity with connective tissue release and build resiliency through pain biology education and mindfulness exercises.[35] Psychosocial support programs may be pursued through traditional means (eg, cognitive behavioral therapy, nursing-led coaching sessions) or convenient mobile and web-based platforms (eg, Curable Health, SuperBetter, Headspace).

Weinrib and colleagues have reviewed their approach for the Transitional Pain Service at Toronto General Hospital.[36] Their comprehensive program designed to support psychological flexibility in managing pain aims to improve acute postoperative pain, hasten functional recovery, and promote protective factors against chronic postsurgical pain. In **Table 1**, we match the theoretic framework by Weinrib and colleagues for 6 key psychological barriers to recovery with examples of postoperative challenges and supportive care approaches. Surgeons may find these tips most helpful for patients with previously described risk factors. Further research should investigate how multi-modal perioperative programs combining psychological and physical interventions may synergistically improve outcomes, similar to nonsurgical chronic pain treatment plans.

Analgesics and adjuvants

Contemporary postoperative regimens use nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen with as-needed use of opioids or partial opioid agonists. In our experience, most patients with chronic pain do well with the same medications as patients without chronic pain, noting special prescribing considerations for patients with preoperative opioid or other high-risk medication use described previously. As-Sanie et al. and Wong and colleagues have both explored preoperative assessments to aid in the prediction of postoperative opioid use through the FSS and the Postoperative Opioid Calculator for Hysterectomy (POOCH), respectively.[33,37] The primary findings from these studies and the broader surgical literature is that patients have been prescribed 2 to 4 times the average number of opioid tablets actually used after hysterectomy. Strategies to reduce unused opioids include standardized prescribing guidelines with fewer tablets (eg, Michigan Surgical Quality Collaborative) and engaging patients in shared decision-making.[38] We tailor preoperative counseling and postoperative reassurance acknowledging that prolonged use of analgesics is often necessary for patients with chronic pain. While the POOCH does not perfectly predict postoperative opioid use, it highlights key risk factors for increased use that the surgeon should consider:

Table 1
Psychological barriers and example interventions to improve postoperative recovery for patients with chronic pain

Barrier to Psychological Flexibility[a]	Postoperative Scenario	Examples of Supportive Care Reflecting Principles of Cognitive Behavioral Therapy (CBT)[b]
Inflexible Attention	Fixation on pain sensation impairs the ability to engage in other thoughts/the present. *"All I can think about is how much pain I am in."*	Suggest or guide the patient in activities to engage the 5 senses (eg, mindful eating, diaphragmatic breathing, body scan) and movement (eg, yoga).
Lack of Clarity Regarding Values and Direction	Depressed mood and pessimism about recovery trajectory predominate future thinking. *"I'll never be able to make it through this."*	Identify patient's values for recovery and highlight their strengths (intrinsic) and resources (extrinsic) to help them progress despite challenges.
Inactivity and Behavioral Avoidance	Pain sensation and pain catastrophizing slow or prevent the gradual resumption of daily activities and progress in other important functional domains. *"I'm stuck where I am - no better off today than last week."*	Advise using a journal to track progress toward functional capacity while acknowledging that this work may temporarily increase sensations of pain and distress. It is critical for the patient and their support system and/or care team to celebrate small successes.
Self-as-Content	Inability to separate emotions and automatic thoughts from actions, placing the patient in a passive/reactive role. *"I can't decrease how often I used the opioid medication because the others don't work as well."*	Encourage a neutral approach to automatic thoughts as opposed to viewing these as internal mandates. Set specific, measurable, achievable, realistic, and time-limited goals with planned actions based on values, not emotions.
Cognitive Fusion	Rigid beliefs about the cause and effect of pain and pain management prevent the patient from engaging in health promotion behaviors. *"I'll heal faster if I stay in bed because things that cause pain will harm me."*	Find common ground by asking open-ended questions instead of criticizing a patient's understanding of pain. Within the limits of the patient's acceptance, establish shared goals that view pain as a mental construct.

Experimental Avoidance	Pain is worsened by the cycle of fear of pain, activity avoidance, decreased mobility and endurance, and impaired functioning. *"I can't try doing the things you said because it will cause more pain."*	Encourage shifting focus away from avoidance of negative experiences and moving toward positive experiences. Start with short-term goals that the patient feels they can accomplish.

[a] Psychological barriers to postoperative recovery as described by Weinrib et al. in the approach by the Transitional Pain Service at the Toronto General Hospital.[36].
[b] Supportive care examples broadly reflect principles of CBT that may emphasize mindfulness, collaborative empiricism, goal setting, objective monitoring, and more specialized approaches such as Acceptability and Commitment Therapy (ACT).

- Pain severity from CPP or endometriosis
- Preoperative opioid use and whether chronic opioids will be tapered off or continued postoperatively
- Expectations for postoperative pain level and medication use
- Psychological comorbidities—specifically depression, anxiety, and pain catastrophizing

Severe side effects and poor analgesic responses may occur due to medication interactions or genetic differences in CYP enzyme activity. If this dyad occurs, we promptly change in an opioid metabolized in a different pathway, such as from tramadol to oxycodone, rather than dose or frequency escalation. Differentiating the use of opioids for treating postoperative pain versus chronic pain or nonpain symptoms (eg, poor sleep, anxiety) is critical to prevent inappropriate prescribing. Finally, multiple guidelines recommend against the use of long-acting opioids for the treatment of acute pain due to the risks of long-term dependence and difficulty in tapering.[32]

For patients who cannot use NSAIDs, have prior issues with poorly controlled perioperative pain, or have inadequate acute pain control with 40 MME per day, we often use either gabapentinoids and/or muscle relaxers. There are existing concerns about the concomitant use of these medications with opioids, but those risks must be weighed against the risks of further escalation of opioid therapy. The choice is guided by the presence of comorbid pain generators (eg, low back pain, pelvic floor myalgia) and, if responding to suboptimal pain control postoperatively, the character and location of pain (eg, nociceptive, neuropathic).

Few studies have evaluated the efficacy of nonpharmacological interventions for postoperative care in patients with CPP after hysterectomy. We find mindfulness-based stress reduction and gentle yoga to be particularly useful to increase mental and physical positive stimuli and to achieve functional outcomes. Outpatient regional nerve blocks or trigger point injections may target specific pain foci. Other strategies include ice packs, heating pads, nonrigid bracing devices, graduated exercise, and massage therapy.[32] Finally, clinicians are well-positioned to promote patient recovery through engaged and attentive care and encouragement of patients' support system to aid their care as well. These ideals are not always addressed in formal studies on chronic pain interventions but are likely major contributors to treatment success.

SUMMARY

Hysterectomy remains an important treatment option for patients with CPP refractory to conservative therapy. Firm conclusions about its efficacy are impaired by the lack of a singular definition of CPP. Nonetheless, favorable outcomes have been reported for well-selected patients with only 5% to 26% of women reporting failure to achieve a significant or complete improvement in pain. Preoperative assessment should start with a comprehensive pain history to identify psychological comorbidities that predispose to chronic pain and to diagnose and treat COPCs as indicated. Patients are most likely to achieve relief from midline pelvic pain linked to the uterus by menstrual activity or tenderness on examination. Even for subgroups of patients with a high degree of central sensory sensitivity, hysterectomy for targeted symptoms has been shown to produce significant improvement in pain.

Surgical planning should address the need for the treatment of extrauterine pathology including deeply infiltrating endometriosis and ovarian removal. There is considerable benefit to ovarian conservation for young patients with modest increases in reoperation rate after hysterectomy. Beyond standard ERAS interventions, there are special postoperative considerations for patients with chronic pain including

managing opioid use (preexisting and postoperative regimens), expanded use of non-opioid adjuvant medications, early treatment of complications or pain generators, and intentional communication strategies reflecting the biopsychosocial context for pain.

CLINICS CARE POINTS

- A standardized history and examination for all patients with pelvic pain will aid in screening for COPCs (eg, BPS/IC) and in localizing specific sources of nonuterine pain (eg, levator ani myalgia).
- While psychological risk factors for centralized pain increase the risk of persistent or new pain after hysterectomy, these conditions should not preclude hysterectomy for patients with pain attributed to the uterus by history and/or examination.
- Success of hysterectomy is ultimately determined by the patient's goals and expectations, so we discuss and document that some symptoms (eg, dysmenorrhea) have a very high chance for resolution and others (eg, urinary urgency worsened during menses) are less predictable.
- In addition to multi-modal analgesia, patients with chronic pain benefit from supportive care that reinforces optimism and psychological flexibility.

DISCLOSURE

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