

Acute pain management after vaginal delivery with perineal tears or episiotomy

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ABSTRACT

Background A vaginal delivery may be associated with acute postpartum pain, particularly after perineal trauma. However, pain management in this setting remains poorly explored.

Objective The aim of this systematic review was to evaluate the literature and to develop recommendations for pain management after a vaginal delivery with perineal trauma.

Evidence review MEDLINE, Embase, and Cochrane databases were searched for randomized controlled trials (RCTs) and systematic reviews assessing pain after a vaginal delivery with perineal tears or episiotomy until March 2023. Cochrane Covidence quality assessment generic tool and the RoB Vis 2 tool were used to grade the quality of evidence.

Findings Overall, 79 studies (69 RCTs and 10 systematic reviews and meta-analyses) of good quality of evidence were included. Acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs) are recommended as first-line treatment. Epidural morphine (≤ 2 mg) is recommended among women with labor epidural analgesia and severe perineal tears, with adequate respiratory monitoring. Local anesthetic infiltration, topical local anesthetic, ointment application, and pudendal nerve block are not recommended due to insufficient or lack of evidence. Ice or chemical cold packs are recommended for postpartum pain first-line treatment due to their simplicity of use. Transcutaneous nerve stimulation and acupuncture are recommended as adjuvants. When a perineal suture is indicated, a continuous suture compared with an interrupted suture for the repair of episiotomy or second-degree perineal tears is recommended for the outcome of pain. For women with first-degree or second-degree perineal tears, no suturing or glue compared with suturing is recommended for the outcome of pain.

Conclusions Postpartum pain management after a vaginal delivery with perineal trauma should include acetaminophen, NSAIDs, and ice or chemical cold packs. Epidural morphine should be reserved for severe perineal tears. A surgical repair technique should depend on perineal tear severity.

PROSPECT RECOMMENDATIONS

► Acetaminophen and non-steroidal anti-inflammatory drugs are recommended for postpartum pain first-line treatment among women

with perineal tears or episiotomy. The oral route should be preferred over the rectal route.

- Ice or chemical cold packs are recommended for postpartum pain first-line treatment due to their simplicity of use. The technique (either ice packs or gel pads) remains at the clinician's discretion.
- Transcutaneous nerve stimulation and acupuncture are recommended as adjuvants for postpartum pain treatment.
- Epidural morphine (≤ 2 mg) is recommended for postpartum pain treatment among women with labor epidural analgesia and severe perineal tears. Women treated with epidural morphine should have respiratory monitoring according to the Society of Obstetric Anesthesiology and Perinatology guidelines.
- When a perineal suture is indicated, a continuous suture compared with an interrupted suture for the repair of episiotomy or second-degree perineal tears is recommended for the outcome of pain.
- For women with first-degree or second-degree perineal tears, no suturing or glue compared with suturing is recommended for the outcome of pain.

Why was this guideline developed?

A vaginal delivery may be associated with significant postpartum pain, particularly in the context of episiotomy or perineal tears. However, evidence-based recommendations for optimal management of pain in this setting are scarce. The aim of this study was to critically evaluate the available literature and provide clinicians with an evidence-based approach for pain management after a vaginal delivery with perineal tears or episiotomy.

Are there guidelines available on this topic?

The American College of Obstetrician and Gynecologists has published in 2018 a clinical consensus on postpartum pain management focusing on a stepwise approach of systemic analgesia, without including regional analgesia and non-pharmacological techniques. The College of French Obstetricians and Gynecologists has provided guidelines in 2018 on surgical repair for perineal tears and episiotomy. Neither of these guidelines reflect the procedure-specific postoperative pain management (PROSPECT) approach for guideline development.



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How does this guideline differ from other guidelines?

These evidence-based recommendations are conducted according to the PROSPECT methodology, which considers clinical practice, efficacy, and adverse effects of pharmacological and non-pharmacological analgesic techniques.

INTRODUCTION

Worldwide, 80% of pregnant women deliver vaginally. Pain after a vaginal delivery is frequently reported, with almost half of the patients experiencing acute postpartum pain, particularly in the context of perineal tears or episiotomy.¹ Postpartum pain is unpleasant and may interfere with a mother's ability to take care of her infant and herself. Acute postnatal pain is also expected to have a negative impact on breastfeeding and mother-infant bonding.² Besides, acute postpartum pain is a risk factor for persistent pain and for postpartum depression.^{3,4} Therefore, clinicians should be clearly aware of the optimal approach to postpartum pain management after a vaginal delivery. However, in contrast with pain management after cesarean delivery,⁵ postpartum pain management after a vaginal delivery remains poorly explored. Guidelines on pain management in this setting are scarce and often focused on one specific approach: the French College of Obstetricians and Gynecologists (CNGOF) published in 2018 national recommendations on surgical repair for perineal tears and episiotomy, taking into account the level of postpartum pain associated with each procedure⁶; in 2021, the American College of Obstetricians and Gynecologists (ACOG) published a clinical consensus for postpartum pain management after a vaginal delivery only focused on a pharmacological stepwise approach for systemic analgesic use and without including regional analgesia or surgical technique.⁷

The procedure-specific postoperative pain management (PROSPECT) working group is a collaboration of surgeons and anesthesiologists working to formulate procedure-specific recommendations for pain management after potentially painful interventions and procedures.^{8,9} These recommendations are based on a procedure-specific systematic review of randomized controlled trials (RCTs), systematic reviews, and meta-analyses. The methodology considers clinical practice, efficacy, and adverse effects of analgesic techniques.^{8,9} We applied this methodology to pain management after a vaginal delivery with perineal tears or episiotomy.

The aim of this systematic review was to evaluate the available literature about pharmacological (systemic and regional analgesia) and non-pharmacological approaches, as well as surgical interventions, on acute pain after a vaginal delivery with perineal tears or episiotomy. The primary outcome was postpartum pain scores. Other outcomes, including supplemental non-opioid analgesic consumption, opioid consumption, adverse events, and wound healing, were also assessed when reported. The final goal was to provide recommendations on postpartum acute pain management after a vaginal delivery with perineal tears or episiotomy.

METHODS

This systematic review was prospectively registered on the International Prospective Register of Systematic Reviews (PROSPERO; CRD42022342275). The methods of this review adhered to the PROSPECT methodology as previously reported.⁹ The inclusion criteria were meta-analyses or RCTs exploring the effect of an intervention on postpartum pain after a vaginal delivery with perineal tears or episiotomy and reporting pain intensities. Studies reporting combined data

from patients' mixed vaginal delivery with and without perineal trauma or episiotomy were only included if data specific for a vaginal delivery with episiotomy or perineal tears were available for extraction. RCTs included in the meta-analyses were secondarily excluded. Studies exploring analgesic effects of aspirin were also excluded as this drug is associated with multiple side effects and not recommended in breastfeeding women. PubMed, Embase, MEDLINE, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews were searched for all RCTs, systematic reviews, and meta-analyses published until March 2023, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)¹⁰ search protocols. The search terms used included Medical Subject Heading (MeSH) terms, text words, and word variants related to postpartum pain management after a vaginal delivery with perineal tears or episiotomy (online supplemental file 1). Two authors (XL and AL) working independently conducted the literature search, screening, and exclusion of irrelevant studies. Reference lists of retrieved articles were hand searched to identify additional studies. Any disagreement between the two reviewing authors was resolved by a third one (M-PB).

Quality assessment, data extraction, and data analysis adhered to the PROSPECT methodology.^{8,9} Pain intensity scores were used as the primary outcome measured. A change of more than 10 mm on the 100 mm visual analog scale (VAS) or 1 in the 10-point numerical rating score was considered clinically relevant.¹¹ Other recovery outcomes, including opioid requirements and adverse effects, were also assessed when reported, and the limitations of the data were reviewed. Heterogeneity in study designs and in results reporting restricted pooled analysis, and meta-analysis could not be performed. We assessed the quality of each included study using the Cochrane Covidence quality assessment generic tool and the RoB Vis 2 tool.

Recommendations were made according to the PROSPECT methodology.^{8,9} We determined the strength of recommendations depending on the quality of included studies, consistency of evidence, and study design. The proposed recommendations were sent to the PROSPECT working group for review and comments, and a modified Delphi approach was utilized as previously described.¹² Considering the wording of PROSPECT recommendations, for a given intervention, the term "lack of evidence" is used when the studies exploring the analgesic effect for an intervention provide negative results. The term "insufficient evidence" is used when the number of the studies and/or their quality is insufficient to recommend this intervention, in accordance with the PROSPECT methodology. First-line treatments were identified as the interventions for which there is the most evidence available in the literature and with a favorable benefit-risk balance. Once a consensus was achieved, the lead authors drafted the final document, which was ultimately approved by the whole working group.

FINDINGS

A total of 79 studies were included: 69 RCTs and 10 systematic reviews and meta-analyses (see figure 1: PRISMA flow chart). The study characteristics are summarized in online supplemental table S1. The assessment of the quality of the included studies using the RoB Vis 2 tool is provided in online supplemental table S2.

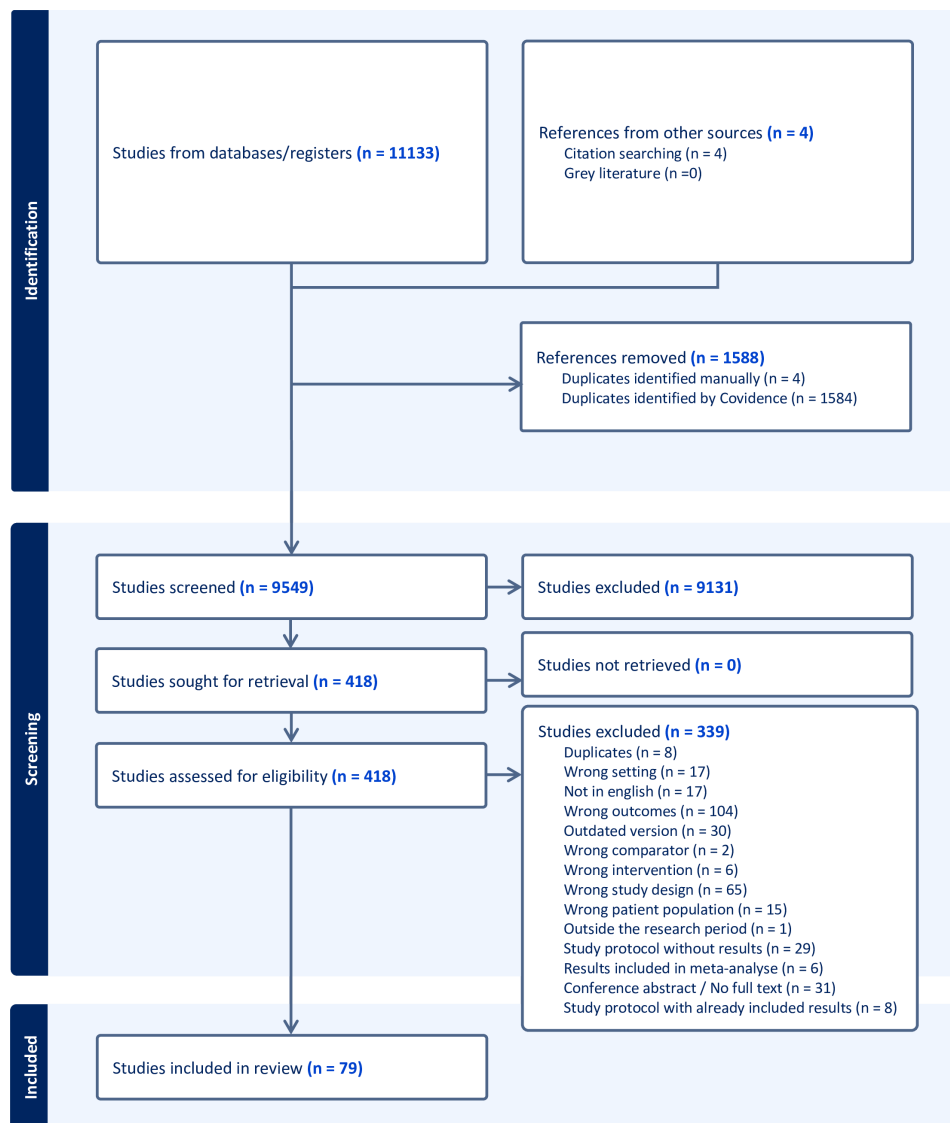


Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.

Pharmacological analgesia

Systemic analgesics

Acetaminophen

A Cochrane meta-analysis published in 2021 included 10 RCTs comparing a single dose of acetaminophen (500 or 650 mg in 5 studies and 1000 mg in 6 studies—1 study exploring the different doses of 650 mg and 1000 mg) versus placebo in patients who had a vaginal delivery with episiotomy.¹³ The authors reported that pain score at 4–6 hours in the postpartum period and additional analgesic consumption were significantly reduced in the acetaminophen group versus placebo but with significant heterogeneity. Of note, the methodology was not clearly documented in most of the studies included in this meta-analysis. Thus, the authors assessed the risk of bias as unclear. Blinding was the only characteristic consistently present in all the included studies.

No significant differences in side effects were notified. Another study by Skovlund *et al*, published in 1991 and not included in the previous meta-analysis, reported significantly lower pain scores with acetaminophen versus placebo for pain from uterine cramping and episiotomy.¹⁴ One RCT investigating the effect of acetaminophen plus tramadol rectal suppository compared with placebo in women who had episiotomy and local

infiltration with 1% lidocaine at the perineorrhaphy site did not show any difference in pain scores between the two groups.¹⁵ Of note, none of the patients included in these studies were treated with non-steroidal anti-inflammatory drugs (NSAIDs).

Acetaminophen is recommended for first-line postpartum pain treatment among women with perineal tears or episiotomy.

Non-steroidal anti-inflammatory drugs

Oral NSAIDs versus placebo

A meta-analysis published in 2021 included 35 studies with 5136 women treated with either a single oral dose of NSAIDs or placebo for postpartum pain after a vaginal delivery with episiotomy or perineal tears (first or second degree).¹⁶ A single administration of 12 different NSAIDs was compared with placebo. Overall, the authors reported significant improved pain relief among women treated with NSAIDs versus placebo at 4 and 6 hours. Harrison *et al*, in a study published in 1992, not included in the previous meta-analysis, also reported a statistically beneficial effect of indomethacin 50 mg versus placebo on perineal pain after a vaginal delivery with episiotomy.¹⁷

Rectal NSAIDs versus placebo

One meta-analysis published in 2003 evaluated the efficacy of rectal NSAIDs versus placebo on postpartum pain after episiotomy.¹⁸ The authors demonstrated that women treated with rectal NSAIDs (diclofenac 100 mg) were less likely to experience perineal pain at 24 hours and that the need for additional analgesia was significantly decreased at 24 and 48 hours after birth. Four other studies published afterward compared rectal diclofenac with placebo in postpartum pain after episiotomy.^{19–22} In all these studies, perineal pain was significantly lower in the diclofenac groups. Similarly, a study from Wilasrusmee *et al*, published in 2008, comparing rectal naproxen 550 mg with placebo among women with perineal trauma, reported significantly less perineal pain at 24 hours and less frequent acetaminophen use in patients treated with rectal naproxen.²³

Comparison between different NSAIDs

Three studies compared different oral NSAIDs or cyclooxygenase inhibitors with each other for pain relief after perineal trauma. Facchinetti *et al* compared oral diclofenac 100 mg with oral ketoprofen 100 mg on perineal pain after episiotomy or perineal tears²⁴, Lim *et al* compared oral diclofenac 100 mg with oral celecoxib 200 mg on perineal pain after episiotomy or perineal tears²⁵, and Suhrabi *et al* compared oral ibuprofen 400 mg with celecoxib 100 mg on perineal pain after episiotomy.²⁶ There was no difference between groups in perineal pain at 24 hours in any of these three studies. Three studies compared rectal NSAIDs with each other on postpartum pain after episiotomy or perineal tears. Rezaei *et al*²⁰ and Altungül *et al*²⁷ reported that rectal diclofenac 100 mg was significantly superior to rectal indomethacin 100 mg (respectively at the 4th hour postpartum and at the 1st and 24th hour postpartum). Contrastingly, Yildizhan *et al* showed no difference in pain score at 24 hours between rectal diclofenac 100 mg and rectal indomethacin 100 mg.²⁸ One study comparing rectal diclofenac with oral mefenamic acid did not report any difference in perineal pain at 6th and 24th hour.²⁹

NSAIDs are recommended for first-line postpartum pain treatment among women with perineal tears or episiotomy. The oral route should be preferred over the rectal route, as it offers similar analgesic benefits.

NSAIDs versus acetaminophen or both

In the meta-analysis from Wuytack *et al*, more women achieved adequate pain relief with oral NSAIDs as compared with oral acetaminophen at the 4th hour, but there was no difference at the 6th hour.¹⁶ One study comparing intravenous dexketoprofen 50 mg and intravenous acetaminophen 1000 mg, not included in Wuytack *et al*, reported no significant difference in perineal pain after episiotomy or perineal tears from the 1st to 6th hour.³⁰ Peter *et al* found no differences in perineal pain in the first 24 hours between oral ibuprofen 400 mg and oral acetaminophen 600 mg with codeine 60 mg and caffeine 15 mg given every 4 hours as baseline analgesia among women with episiotomy or a third-degree or fourth-degree perineal tear.³¹

No study has explored the effects of acetaminophen combined with NSAIDs on postpartum pain among patients who had a vaginal delivery with perineal trauma.

Other systemic drugs

Tramadol versus NSAIDs

One RCT compared oral celecoxib (200 mg) with oral tramadol (100 mg) in obese primiparous women who had a vaginal delivery with episiotomy.³² The authors reported significantly lower pain

scores at 1, 2, and 4 hours, and fewer patients needed additional analgesics in the tramadol group than in the celecoxib group. In accordance with the PROSPECT methodology, we cannot draw conclusions or make recommendations based on a single study.

Tramadol is not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to insufficient evidence.

Opioids versus placebo

One RCT compared the analgesic efficiency of transnasal butorphanol (four groups: 0.25 mg, 0.5 mg, 1 mg, and 2 mg) with placebo on perineal pain after a vaginal delivery with episiotomy.³³ Pain relief was significantly improved within the first 6 hours only in the 2 mg group as compared with placebo. In accordance with the PROSPECT methodology, we cannot draw conclusions or make recommendations based on a single study.

Butorphanol and other opioids are not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to insufficient evidence.

Regional analgesic interventions

Epidural morphine

Three studies investigated the analgesic effects of epidural morphine administered after childbirth versus placebo (saline).^{34–36} In these studies, epidural morphine doses ranged from 1 to 4 mg. In the RCT from Niv *et al*, including 90 women who had a vaginal delivery with episiotomy, the incidence of pain was significantly decreased among patients treated with epidural morphine (2 mg) as compared with placebo.³⁴ Similarly, in the study from McDonald *et al* comparing 2 mg epidural morphine with 4 mg epidural morphine with placebo in 150 women after a vaginal delivery with episiotomy, a significant decrease in pain scores and in analgesic consumption at the 4th and 12th hours was observed in the 2 mg and 4 mg epidural morphine groups as compared with placebo but not at the 24th hour.³⁵ When asked about the presence of pruritus, 72% and 59% of patients who were treated with epidural morphine, 4 mg and 2 mg, respectively, responded positively. Urinary retention did not differ among groups. In the study from Solano *et al*, patients were randomized into three groups (epidural morphine 2 mg, epidural morphine 3 mg, and saline) among women who had a vaginal delivery with or without perineal trauma (74% high-degree perineal tears or episiotomy).³⁶ In the subgroup analysis of patients who had perineorrhaphy, the need for additional analgesic use was significantly decreased in the morphine groups as compared with placebo, without significant difference in pain scores. The incidences of pruritus (36.8%, 30.7%, and 8.1%, respectively, in the 2 mg, 3 mg, and saline group), nausea (18.4%, 15.4%, and 5.4%, respectively), and vomiting (7.9%, 15.4%, and 2.7%, respectively) were high in the intervention groups but did not require specific treatment; two patients in the 3 mg morphine group had urinary retention and none in the two other groups.

Epidural morphine is recommended for postpartum pain treatment among women with severe perineal tears. As adverse effects, and in particular respiratory depression, depend on the dose of epidural morphine, we recommend the use of an epidural morphine dose ≤ 2 mg, corresponding to the minimum effective dose. Women treated with epidural morphine should have respiratory monitoring according to the Society of Obstetric Anesthesiology and Perinatology (SOAP) guidelines.³⁷

Pudendal nerve block

Analgesic effect of pudendal nerve block on perineal pain after a vaginal delivery with episiotomy was studied in one RCT.³⁸ In this trial, Aissaoui *et al* reported significant lower postpartum pain scores while sitting and walking for 24 hours after delivery among patients who received pudendal block with ropivacaine 0.75% versus placebo (40 patients overall).

Pudendal nerve block is not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to insufficient evidence.

Perineal infiltration

Seven studies explored perineal infiltration after episiotomy, but only two of them were compared with placebo. Schinkel *et al* compared pain after infiltration of the episiotomy scar with 0.75% ropivacaine or 1% lidocaine or saline and found no significant difference in pain score.³⁹ Similarly, Cardaillac *et al* compared pain after infiltration of the episiotomy scar with 0.75% ropivacaine or saline and found no significant difference in pain score.⁴⁰ Three studies compared lidocaine infiltration without or with adjuvant (clonidine,⁴¹ dexamethasone,⁴² or ketorolac⁴³) but without placebo group. One study compared perineal pain after bupivacaine (plain vs liposomal) infiltration without a control group.⁴⁴ Finally, Khan *et al* compared women who had epidural analgesia and saline infiltration with women who had no epidural but a perineal infiltration with 15 mL of 0.5% lidocaine before repair.⁴⁵ Again, no conclusions about perineal infiltration analgesic efficiency could be drawn from these five studies.

Perineal infiltration of episiotomy scar is not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to a lack of evidence.

Topical perineal local anesthetic

Topical local anesthetics versus placebo

One meta-analysis published in 2005 included eight RCTs, with five comparing topical perineal anesthetic with placebo and assessing pain up to 24 hours postpartum among women who had perineal trauma.⁴⁶ The authors did not report any significant difference in pain relief with topical anesthetic and concluded that the evidence for this intervention was not compelling. Three other studies, not included in the previous review, compared the perineal application of topical local anesthetics with placebo after the suture of episiotomy scar.^{47–49} Only the study from Kafali *et al* reported a positive effect of topical local anesthetic (bupivacaine-soaked Spongostan) on pain scores at 24 hours versus placebo.⁴⁸

Of note, there were great variations between all the studies in terms of the nature of local anesthetic explored (procaine spirit, lidocaine-prilocaine cream, 1%–2% lidocaine gel, 2% lidocaine cream, 1% pramoxine hydrochloride gel, 5% lidocaine spray or pomade, 2% cinchocaine spray, and bupivacaine-soaked Spongostan).

Topical local anesthetics versus NSAIDs

One study from Seckin *et al* compared vaginal indomethacin 100 mg with 5% lidocaine pomades,⁴⁷ and a study from Delaram *et al* compared oral mefenamic acid 250 mg with 2% lidocaine cream.⁵⁰ In these two studies, the pain scores were similar.

Topical local anesthetics are not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to a lack of evidence.

Hydrocortisone cream versus placebo

One study from Manfre *et al* compared the use of hydrocortisone cream with placebo and no cream (three groups of treatment, each patient being her own control).⁵¹ The authors did not report any difference in pain score decrease between topical glucocorticoids and placebo cream.

Hydrocortisone cream is not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to a lack of evidence.

Ointments

11 studies explored the analgesic effect of various ointments versus placebo applied on the episiotomy scar.^{52–62} The studied ointments were as follows: theseseniol, bromelain, chamomile, ginger extract, *Hypericum perforatum*, *Achillea millefolium*, 2% cinnamon, *Silybum marianum*, olive leaf extract, honey, 3% *Equisetum arvense*, and fundermol. A decrease in pain scores statistically significant but not clinically relevant was reported with *Equisetum arvense*,⁶⁰ cinnamon,⁵⁶ and *Silybum marianum* separately.⁵⁷ A clinically significant decrease in pain scores at 7 and 10 days was reported with chamomile cream versus placebo.⁵⁴

Because of the variation between studies in ointment types explored, it was not possible to provide recommendation on these interventions.

A study by Moudi *et al* comparing wound healing and pain scores after fumigation of episiotomy wounds with mastic (*Pistacia lentiscus*) oleoresin versus control did not report any difference in pain score at 24 hours.⁶³

Ointments are not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to a lack of evidence or, in the case of chamomile cream, due to insufficient evidence.

Non-pharmacological interventions

Ice and chemical cold packs

Seven RCTs compared ice packs with placebo^{64–67} or gel pads versus ice packs versus placebo or no treatment^{68–70} for perineal pain after a vaginal delivery with episiotomy or perineal tears. Overall, four out of these RCTs (three with ice pack and one with either gel pad or with ice pack separately) reported a significant decrease in pain scores within the first 24–48 hours in the intervention group.^{64–66,70} Another trial reported transitory effects at 20 min with either ice pack or gel pads versus control.⁶⁷ Two studies with the same first author did not report significant analgesic effects of ice pack or gel pad versus placebo or versus compression foam pads.^{68,69}

A systematic review from Kim *et al* published in 2020 including 11 RCTs (1492 women), which included the seven above-mentioned studies,^{65–71} described that cold application initiated immediately after birth or up to 24 hours postpartum is effective in alleviating pain at day 2 among women who had vaginal birth with episiotomy or perineal tears (two studies).⁷¹ In this meta-analysis, ice pack and gel pad had similar analgesic effects. A meta-analysis from the Cochrane database published in 2020 including 10 RCTs enrolling 1233 women with perineal tears or episiotomy randomized to the use of a cooling treatment compared with no treatment or placebo reported that there was limited to very low certainty evidence that cooling treatment may reduce perineal pain within 4–6 hours or between 24 and 48 hours after giving birth.⁷² Finally, a meta-analysis published by Kirça *et al* in 2021 including seven studies evaluating cold gel pack/pad, crushed ice gel pad, and ice pack after episiotomy

showed a significant reduction in postpartum pain.⁷³ No adverse effects were reported in any of these studies, in particular no injury related to cold application.

Ice or chemical cold packs are recommended for postpartum pain first-line treatment among women with perineal tears or episiotomy due to their simplicity of use. The technique (either ice or chemical cold packs) remains at the clinician's discretion.

Acupuncture

Three studies explored the analgesic effect of acupuncture in the immediate postpartum on pain after a vaginal delivery. Two open studies, one using acupressure applied to points LV4 and LI4⁶⁵ and the second using auricular acupuncture (internal genital organ point, external genital organ point, and Shenmen point),⁷⁴ reported significant reduced pain scores with acupuncture as compared with standard care or no acupuncture. The only blind study did not find a significant difference in perineal pain between auricular acupuncture (apex of the auricle, the point of the anus, the point of the external genital organs, and the Shenmen point) and tapes and seeds on irrelevant auricular points.⁷⁵

Acupuncture is recommended as an adjuvant for postpartum pain treatment among women with perineal tears or episiotomy with a low level of evidence.

Transcutaneous nerve stimulation

Two studies compared transcutaneous nerve stimulation (TENS) applied between 6 and 24 hours postpartum to the perineal area to TENS off or to no treatment among women who had episiotomy.^{74 76} Both reported a significant decrease in pain scores at 60 min after TENS. No data were available after 120 min.

TENS is recommended as an adjuvant for postpartum pain treatment among women with perineal tears or episiotomy.

Radiofrequency therapy

Among women with perineal tears or episiotomy, one study compared radiofrequency therapy to no treatment,⁷⁷ and another study compared therapeutic ultrasound with low-level laser therapy.⁷⁸ Both were negative.

Radiofrequency or therapeutic ultrasound is not recommended for postpartum pain treatment among women with perineal tears or episiotomy due to a lack of evidence.

Surgical techniques

Regarding surgical management, there were 10 studies and 3 systematic reviews on the impact of management and repair of perineal tears or episiotomy wounds on postpartum pain.

No suture versus suture

A systematic review published in 2011 in the Cochrane Library compared suturing with no suturing of first-degree and second-degree perineal tears.⁷⁹ This systematic review included 2 RCTs for a total of 154 patients.^{80 81} There was no significant difference between the two groups in terms of early and long-term pain or healing.

An RCT from Swenson *et al* published in 2019 compared suture with non-suture and surgical glue for the management of second-degree perineal tears (three groups).⁸² The authors reported significantly higher pain scores in the group of women with suture as compared with non-suture and surgical glue. Wound healing was similar across the groups. With a similar design, Lallemand *et al* observed that perineal pain scores were higher in the systematic suture group at day 1.⁸³

For women with first-degree or second-degree perineal tears, no suturing compared with suturing is recommended for the outcome of pain.

Continuous versus interrupted suture

A meta-analysis from the Cochrane Library including 16 RCTs and comparing continuous suture with interrupted suture for repair of episiotomy or second-degree tears on postpartum pain was published in 2012.⁸⁴ The authors reported that continuous suture significantly decreased postpartum pain intensity within the first 24 hours after delivery as compared with interrupted suture, as well as the need for additional analgesia. A study published in 2022 also reported a significantly higher rate of women without pain at 24 hours in the continuous suture group as compared with the interrupted suture group for episiotomy repair (72.0% vs 36%, respectively).⁸⁵

For episiotomy or second-degree tears, when a perineal suture is indicated, continuous suture compared with interrupted suture for repair of episiotomy or perineal tears is recommended for the outcome of pain.

Suture materials

A meta-analysis published in 2010 included 18 RCTs comparing different suture materials for perineal repair after a vaginal delivery.⁸⁶ Comparing standard synthetic with rapidly absorbing sutures, no difference in pain intensity was observed between the groups, but more women required suture removal in the standard synthetic suture group. One study published in 2017 compared Vicryl Rapide suture with Monocryl with no significant difference in pain score.⁸⁷ Similarly, another study from Devi *et al* comparing two different polyglactin 910 fast-absorbing sutures, Trusynth Fast and Vicryl Rapid, reported no difference in pain scores.⁸⁸

The decision on the type of suture materials should not be based on the pain outcome.

Glue

Four studies including women with episiotomy or first-degree to second-degree perineal tears compared repair by glue with subcutaneous suture.^{82 89-91} Bowen *et al* reported significantly lower pain score on walking on days 2 and 4 and a shorter period to become pain-free in the group of women treated with enbucrilate tissue adhesive repair versus subcuticular suture.⁹¹ Atesli *et al* showed a significant decrease in pain score within the first 48 hours and up to 6 weeks in the group of women treated with butyl cyanoacrylate tissue adhesive versus 3/0 rapid absorbable polyglactin suture.⁹⁰ In the single-blind RCT by Swenson *et al* comparing three suturing techniques for second-degree perineal tears (surgical glue, suture, and no suture, 35 patients overall),⁸² the authors reported that at 2 weeks postpartum, women with suture had the highest median pain scores on the short-form McGill questionnaire and significantly higher VAS⁸²; wound healing was similar in the three groups. Finally, a study by Mota *et al* found no significant difference in perineal pain between adhesive glue and subcutaneous suture for closure of perineal tears.⁸⁹

For women with first-degree or second-degree perineal tears, glue compared with suturing is recommended for the outcome of pain.

DISCUSSION

This PROSPECT systematic review provides a global strategy for pain management after a vaginal delivery with perineal tear

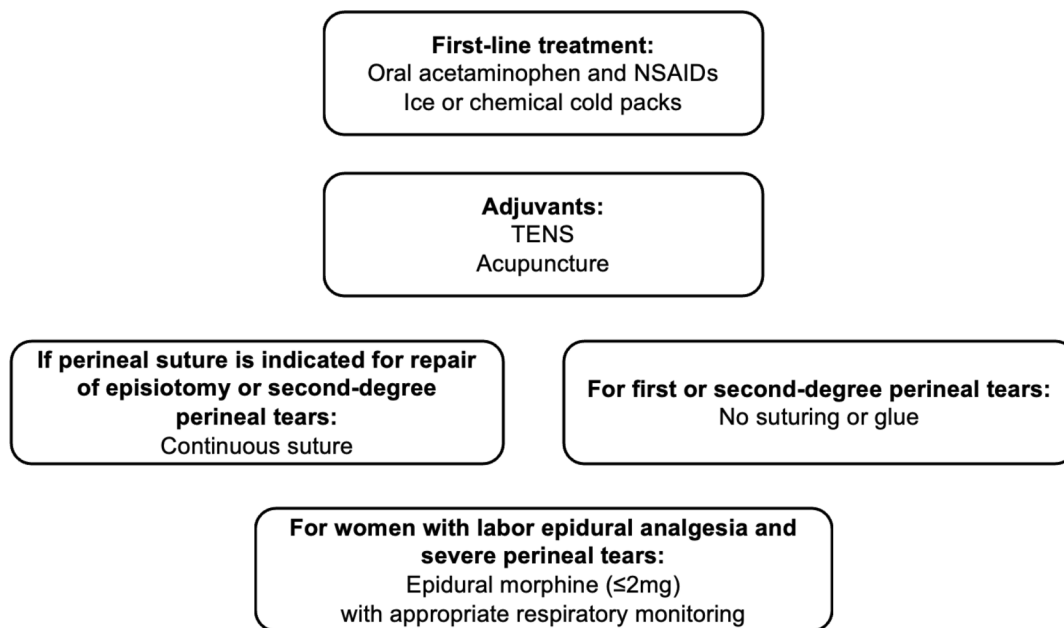


Figure 2 Algorithm for pain management after vaginal delivery with perineal tears or episiotomy.

or episiotomy, including pharmacological systemic and regional interventions with non-pharmacological interventions (see figure 2). Interventions recommended and those not recommended are summarized in tables 1 and 2, respectively.

When discussing systemic drug therapy in postpartum women, breastfeeding should always be considered. Indeed, potential effects on the baby from drug secretion into a mother's milk are of concern. The drugs recommended in these PROSPECT guidelines do not result in reported adverse effects for neonates. Within the first days after delivery, breast milk product is low; thus, some drugs may pass but in very small concentrations. For example, acetaminophen and oral NSAIDs are excreted in low

concentration in breast milk, and ibuprofen breast milk concentration decreases with breastfeeding duration.⁹² At equipotent doses, all NSAIDs have similar analgesic effects.

Looking at the analgesic effect of epidural morphine, although there were clinical benefits with regard to pain relief, the PROSPECT working group decided to restrict its indication to women with severe perineal tears who delivered with epidural labor analgesia and with a maximal epidural morphine dose of 2 mg, because of associated adverse effects, such as pruritus or nausea as well as due to the need for monitoring for respiratory depression. The PROSPECT working group agreed that respiratory monitoring should be applied following the SOAP 2019

Table 1 Recommendations for postpartum pain treatment among women who had vaginal delivery with perineal tears or episiotomy

Intervention	Recommendation	Level of evidence	Strength of recommendations
Acetaminophen and NSAIDs*	Recommended for first-line postpartum pain treatment. The oral route should be preferred over the rectal route	Acetaminophen: moderate NSAIDs: high	Strong
Epidural morphine	Recommended for postpartum pain treatment among women with severe perineal tears. As adverse effects, and in particular respiratory depression, depend on the dose of epidural morphine, we recommend the use of an epidural morphine dose ≤ 2 mg, corresponding to the minimum effective dose. Women treated with epidural morphine should benefit from respiratory monitoring according to the SOAP guidelines ³⁷	High	Strong
Ice or chemical cold packs	Recommended for postpartum pain first-line treatment due to their simplicity of use. The technique (either ice packs or gel pads) remains at the clinician's discretion	High	Strong
Acupuncture	Recommended as an adjuvant for postpartum pain treatment	Low	Strong
TENS	Recommended as an adjuvant for postpartum pain treatment	Moderate	Strong
No suture vs suture	For women with first-degree or second-degree perineal tears, no suturing compared with suturing is recommended for the outcome of pain	High	Strong
Continuous suture vs interrupted suture	For episiotomy or second-degree tears, when a perineal suture is indicated, a continuous suture compared with an interrupted suture for the repair of episiotomy or perineal tears is recommended for the outcome of pain	High	Strong
Glue vs suture	For women with first-degree or second-degree perineal tears, glue compared with suturing is recommended for the outcome of pain	Moderate	Strong

*No study compared the effect of NSAIDs combined with acetaminophen with both alone.
NSAIDs, non-steroidal anti-inflammatory drugs; SOAP, Society of Obstetric Anesthesiology and Perinatology; TENS, transcutaneous nerve stimulation.

Table 2 Summary of not recommended interventions for postpartum pain treatment among women with perineal tears or episiotomy

Intervention	Recommendations
Tramadol	Not recommended due to insufficient evidence
Butorphanol and other opioids	Not recommended due to insufficient evidence
Perineal infiltration	Not recommended due to lack of evidence
Pudendal nerve block	Not recommended due to insufficient evidence
Topical perineal local anesthetics	Not recommended due to lack of evidence
Hydrocortisone cream	Not recommended due to lack of evidence
Ointments	Not recommend due to lack of evidence or to insufficient evidence

consensus statement guidelines. It states that when epidural morphine dose of 2 mg is given in low-risk, healthy women, “it is reasonable to monitor with respiratory rate and sedation measurement every 2 hours for 12 hours.”³⁷ For women with risk factors, such as cardiopulmonary or neurological comorbidity, body mass index of $>40\text{ kg/m}^2$, known or suspected obstructive sleep apnea, chronic opioid use/abuse, hypertension, or magnesium administration, the American Society of Anesthesiologists general guidelines for respiratory monitoring should be applied, even if the dose of epidural morphine is $\leq 2\text{ mg}$: respiratory rate and sedation assessment every hour for the first 12 hours and then every 2 hours for 12–24 hours; consider additional monitoring modalities (pulse oximetry and capnography), continuous versus continual intermittent monitoring as indicated.⁹³

While regional pharmacological interventions are of particular interest in obstetric patients, limiting the drug exposure of the newborn, data on the analgesic effects of such interventions for perineal tears or episiotomy are limited. For example, only one RCT explored the analgesic effect of pudendal block,³⁸ which however potentially may represent an interesting option. Even if this study was in favor of this intervention, data are insufficient to recommend it. Pudendal block for postpartum pain relief clearly requires further investigation. Concerning local infiltration of episiotomy, two RCTs comparing local infiltration with local anesthetic to local infiltration with saline did not report any difference in pain score^{39, 40} However, a third one, comparing local infiltration with saline with no infiltration found a significant lower pain score at day 1 in the group of patients treated with local infiltration.⁴⁵ These results suggest that the perineal edema due to infiltration itself may have an analgesic effect.

Even if the data on TENS or acupuncture analgesic efficiency are limited, these interventions are not associated with dangerous adverse effects. Therefore, the PROSPECT working group recommends both these non-pharmacological methods for pain management after a vaginal delivery with perineal trauma but only as adjuvant therapy.

The main criteria to indicate perineal suturing or not depends on the severity of the tears and not the level of pain associated. In the context of uncomplicated first-degree or second-degree perineal tears, several RCTs reported that non-suturing is associated with less perineal pain than suturing without increased local complication. These results were confirmed in another RCT published after the cut-off for the search of the present systematic review.⁸³ Similarly, the choice of suture materials mostly depends on the surgical strategy. Data included in this PROSPECT systematic review on glue for first-degree or second-degree perineal tears repair are limited to four recent studies comparing glue to suturing, but all in favor of glue for pain scores. A fifth study was published after the cut-off for the search of the present systematic review and again reported significantly

lower perineal pain intensity in the group of women with first-degree or second-degree perineal tears or episiotomy treated with surgical glue as compared with suture.⁹⁴ Of note, a new repair procedure with surgical glue was necessary for six women (8.6%) between 12 and 48 hours postpartum, whereas no need for a new repair procedure was verified in the control group. At the time of the publication of the French guidelines on perineal tears or episiotomy repair in 2018, data on glue were too limited to recommend it. Considering the results of several recent RCTs in favor of glue as compared with suturing on pain score, the PROSPECT working group decided to recommend glue as compared with suturing for the pain outcome for women with first-degree or second-degree perineal tears.

Strengths and limitations

These recommendations provide evidence-based practical guidance for postpartum pain management after a vaginal delivery with episiotomy or perineal tears, a situation concerning millions of patients across the world each year. However, very few recommendations are available on this topic, and they concern only a single aspect of pain management: guidelines from the ACOG are focused on pharmacological interventions⁷ and those from the CNGOF on surgical perineal tract repair.⁶ At the end, the PROSPECT recommendations provide a clear multimodal analgesia strategy, based on systemic analgesic drugs, combined with non-pharmacological interventions and surgical techniques. Besides, these PROSPECT recommendations distinguish pain management according to the severity of perineal tears. These recommendations follow the PROSPECT methodology, based on a systematic review of the literature and a consensus statement from an international and multidisciplinary panel of experts in pain management.

The limitations of this review are mostly based on those of the included studies. There was a great heterogeneity between studies in the choice of the drug tested (particularly in studies exploring analgesic efficacy of topical anesthetics or ointments), in the control group and in the time points of pain assessment, sometimes limiting the possibility to draw conclusion. Most of the studies included were not recent, limiting their representativeness considering changes in practices in the management of the parturient.

Beyond the effects on pain scores and analgesic rescue savings, the impact on outcomes related to maternal well-being or mother-child bonding were not explored in the included studies. In the future, it appears crucial to conduct adequately powered trials that not only evaluate after a vaginal delivery the effects of analgesic interventions on pain, opioid consumption, and opioid-related adverse events but also on maternal satisfaction, mother to infant bonding, breastfeeding, and women mental health in the postpartum period. Finally, as data on pain after a vaginal delivery with intact perineum are very limited, we could not provide any strategy in this context, whereas it concerns most of parturients. Even if pain after an uncomplicated vaginal delivery is certainly low, it should not be trivialized and deserves specific studies.

CONCLUSIONS

In summary, postpartum pain after a vaginal delivery with perineal tears or episiotomy deserves specific management, based on first-line systemic pharmacological analgesia with oral acetaminophen and NSAIDs, associated with non-pharmacological adjuvants, and on first-line ice or chemical cold packs. Epidural morphine should be reserved for severe perineal tears and

associated with appropriate respiratory monitoring, even in healthy women. Surgical technique for perineal repair depends on the degree of perineal tears. If a perineal suture is indicated, continuous suture is recommended over interrupted suture to decrease postpartum perineal pain. For first-degree or second-degree perineal tears, no suture or glue might be possible options.

Several interventions would deserve further research: the combined effects of NSAIDs and acetaminophen versus both alone, the analgesic effect of the pudendal block versus no block, and finally the comparison of perineal infiltration with local anesthetic, versus infiltration with saline versus no infiltration, to explore the potential analgesic property of infiltration itself.

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