Purpose: The purpose of this narrative review is to summarize the evidence derived from randomized controlled trials (RCTs) regarding approaches and techniques for lower extremity nerve blocks.

Source: Using the MEDLINE (January 1966 to April 2007) and EMBASE (January 1980 to April 2007) databases, medical subject heading (MeSH) terms òlumbosacral plexusó, òfemoral nerveó, òobturator nerveó, òsaphenous nerveó, òsciatic nerveó,

mance plus court, co¾t moindre). Pour un bloc du nerf sciatique, lôapproche transglut®ale constitue une m®thode fiable. En raison dôun temps potentiellement plus court pour lô®lectrolocation du nerf sciatique et le positionnement du cath®ter que par la voie transglut®ale, lôapproche subglut®ale devrait ®galement °tre prise en consid®ration. Par rapport ¨ lô®lectrolocation du nerf p®ronier, lô®lectrostimulation du nerf tibial pourrait offrir un taux de r®ussite plus ®lev®, particuli¯rement avec les abords transglut®al et lat®ral poplit®. De plus, lors de la mise en place de blocs sciatique ou f®moral avec de petits volumes dôanesth®siques locaux, une technique dôinjection multiple devrait °tre utilis®e.

Conclusion : Les comptes rendus publi®s dôERC fournis ! ή ‘

sample size justification and 57% blinded assessment. Only 28% provided data about allocation concealment. Primary endpoints varied greatly: for instance, definitions of block success included surgical anesthesia, sensory analgesia (patient cannot feel cold or pinprick) as well as combined sensory analgesia and motor block.

I LUMBAR PLEXUS, FEMORAL, LATERAL FEMORAL CUTANEOUS, OBTURATOR AND SAPHENOUS NERVE BLOCKS

Lumbar plexus block

APPROACHES

The lumbar plexus can be blocked with a posterior approach by injecting LA in a lumbar paravertebral location.[5–8] Alternately Winnie *et al.*[9] have suggested that an inguinal, paravascular injection in the femoral perineural sheath (with concomittant distal manual compression and cephalad angulation of the needle) will lead to retrograde LA migration towards the lumbar plexus. Since the three main terminal branches (femoral, lateral femoral cutaneous and obturator nerves) of the lumbar plexus can be anesthetized with a single injection, this anterior approach is also called "3-in-1 block".

Four RCTs (combined n = 250) have compared single shot anterior and posterior approaches with highly consistent results.[7,10–12] At 30 min, both methods produced similar rates of sensory and motor block of the femoral nerve (93–100 and 73–100% of patients respectively).[7,10,12] Two RCTs have repbCpbĭ o v b ą Ł ej p ilar

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pared perineural catheters inserted with the 3-in-1 and fascia iliaca techniques. The latter method resulted in a faster performance time ($P < 0.05$) and a l Θ < l u o

perineural catheter placement using the subgluteal and posterior popliteal approaches. In one study, more attempts were necessary to achieve successful catheter placement with the latter method.[46] The rate of catheter occlusion or dislodgement did not differ between groups.[47] In the literature, no other RCTs were found comparing approaches for placement of sciatic perineural catheters.

TECHNIQUES

In 20 patients, using new landmarks for the anterior approach (puncture site 2.5 cm medial to the femoral artery and 2.5 cm distal to the inguinal crease), Van Elstraete *et al.*[48] compared placement of the patient's leg in a neutral position or in external rotation. These authors found that, with the latter approach, the sciatic nerve was more quickly electrolocated (46 ± 25 *vs* 79 ± 53 sec; $P < 0.006$). However success rates, distances from skin to nerve, numbers of attempts required and side effects were similar.

Two RCTs (combined $n = 150$) using the posterior transgluteal approach compared a single to a double-injection technique, in which the tibial and peroneal components of the sciatic nerve were independently electrostimulated and anesthetized. In both studies, 20 mL of LA (ropivacaine 0.75% or a mix of lidocaine 1% and tetracaine 0.2%) were used for the two groups. The findings were consistent. A double-injection technique produced a higher success rate at 45 min (75–100 *vs* 55–80% of patients; $P < 0.05$).[36,49] Although associated with a longer performance time (5.5 *vs* 3 min; $P = 0.001$), it also resulted in a quicker onset (15 *vs* 25 min; $P < 0.017$). Thus the total anesthesia-related times were not different between the two groups (20–25 min).[49] In 80 patients undergoing hallux valgus surgery, Taboada *et al.*[50] compared plantar flexion **(**tibial nerve stimulation**)** to dorsiflexion **(**peroneal nerve stimulation) as the stimulatory response guiding a single-injection technique. These authors observed a higher success rate with plantar flexion (87.5 *vs* 55%: $P < 0.05$). Furthermore, the latter also produced shorter onset times for complete sensory and motor block (10 ± 10 *vs* 20 ± 11 min and 13 ± 10 *vs* 24 ± 12 min respectively; both $P < 0.05$). Taboada *et al.*[50] attributed the improved success and onset seen with plantar flexion to the fact that the tibial nerve is the larger of the two sciatic neural components and thus requires more LA to be deposited in its vicinity.

It must be noted that the landmarks used for the transgluteal approach in all the preceding studies n a] tibi¾ v ä ğ µ T

20 mL of an equal mix of lidocaine 2% and bupivacaine 0.5% and seeking foot inversion as the preferred response for the single-injection group, Paqueron *et al.*[58] observed a lower success rate (54 *vs* 88%; $P = 0.007$) with the latter. Onset times for sensory and motor block were similar. In contrast, Arcioni *et al.*[59] randomized 96 patients undergoing foot surgery to a lateral popliteal sciatic block using a single-injection technique seeking tibial nerve stimulation, a single injection seeking peroneal nerve stimulation (dorsiflexion or eversion) or a double-injection technique. The total volume administered was 30 mL of ropivacaine 0.75%. These authors reported that, compared to a double-injection technique, the single-injection method with tibial nerve electrolocation resulted in a similar performance time (400–487 sec) and success rate (94%). However the onset time for sensory blockade was shorter with the single-injection technique (14 ± 7 *vs* 21 ± 14 min; $P < 0.05$). Patients receiving a single injection with peroneal nerve electrolocation displayed a lower success rate than the other two groups (75%).[59] In another RCT ($n = 30$), Taboada Muniz *et al.*[60] also concluded that, compared to plantar flexion, dorsiflexion resulted in a lower success rate (33 *vs* 93%; $P < 0.05$). In addition, onset times

TABLE Areas pertaining to lower extremity nerve blocks warranting further investigation l ó v% -

this review to RCTs published in the English language. Although such a restriction may constitute a methodological limitation, we believe that its impact on overall conclusions is minimal: expansion of our search criteria (using the same databases and time periods) to languages other than English only yielded an additional five RCTs.[62–66] Furthermore, no attempt was made to produce a meta-analysis. In our view, given the wide array of approaches and techniques commonly used for lower extremity anesthesia, patient enrolment would have been insufficient for many approaches and techniques to support a systematic pooling of data. The heterogeneous definitions of endpoints like block success would also make this task very difficult. Finally, all RCTs published in English were kept for the analysis: no studies were excluded based on factors such as sample size justification, statistical power, blinding, definition of interven-

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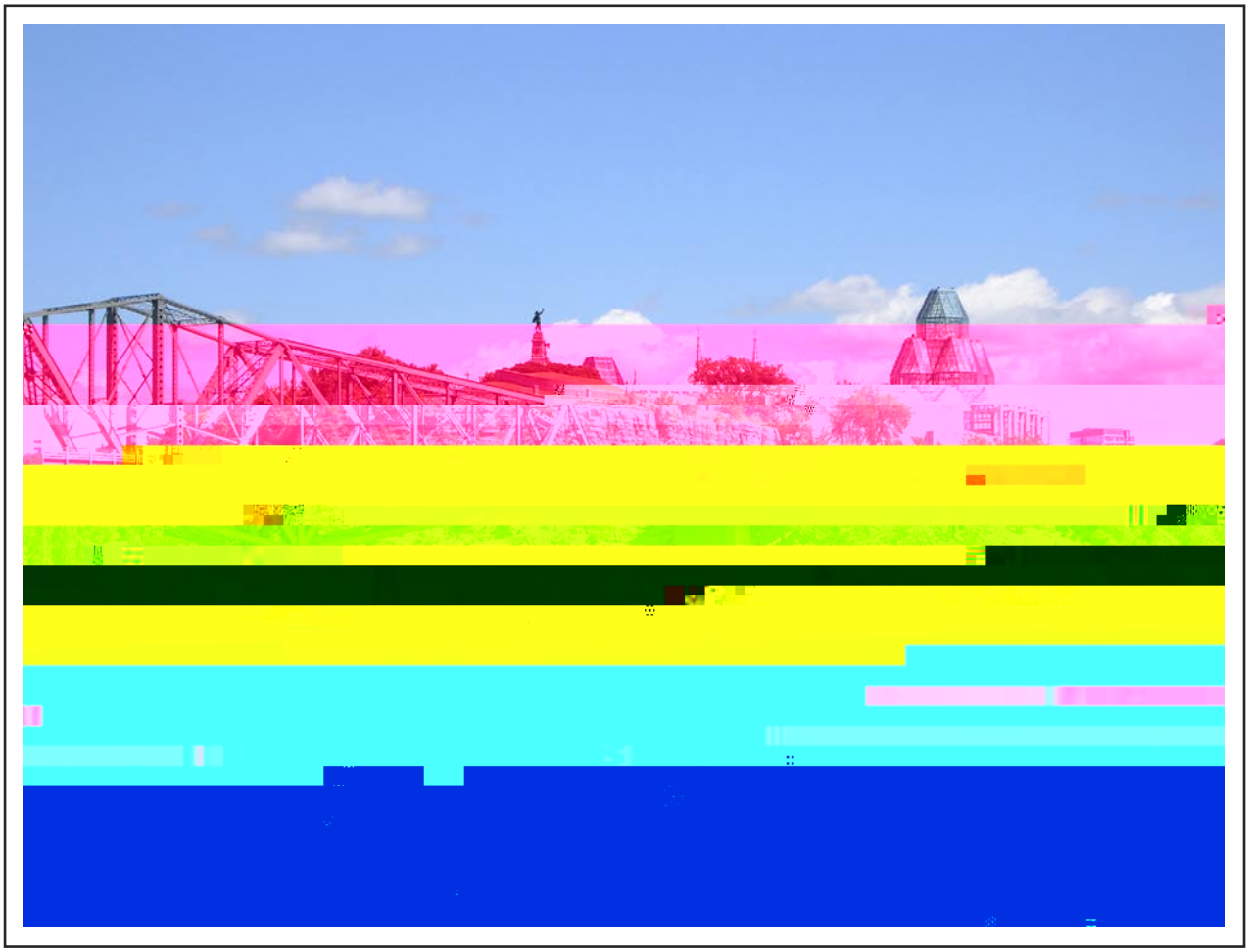

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