Host: Welcome to the *ANESTHESIOLOGY* journal podcast, an audio interview of study authors and editorialists.

Dr. James Rathmell: Hello, I'm Jim Rathmell, Professor of Anesthesia at Harvard Medical School and Chair of the Department of Anesthesiology, Perioperative and Pain Medicine at Brigham and Women's Hospital in Boston. I'm one of the Executive Editors for *ANESTHESIOLOGY* and you're listening to an *ANESTHESIOLOGY* podcast that we've designed for physicians and scientists interested in the research that appears in the journal.

Today we're going to talk with the lead author of an original research article that appears in the January 2021 issue. With us today is Dr. Faraj Abdallah. Dr. Abdallah is Associate Professor of Anesthesiology and Pain Medicine at the University of Ottawa in Ottawa, Ontario, Canada. Dr. Abdallah is the senior author on an article that appears in the January 2021 issue and it is titled, "Postoperative Analgesic Effectiveness of Quadratus Lumborum Block for Cesarean Delivery Under Spinal Anesthesia – a Systematic Review and Meta-analysis." Dr. Abdallah, thank you for joining us.

Dr. Faraj Abdallah: Thank you Jim for this amazing opportunity to communicate with your audience, and we always appreciate being able to address a wider audience and effectively disseminate our research results. So thank you again.

Dr. James Rathmell: Well first, congratulations on the publication of your study. Can you start by briefly describing the most common methods used to provide analgesia for cesarean section?

Dr. Faraj Abdallah: Thank you for the kind sentiments Jim. Analgesia for elective cesarean delivery is a thoroughly standardized recipe. It involves a neuraxial technique, or the spinal or a combined spinal epidural, inclusive of a long active opioid. This is supplemented by postoperative oral acetaminophen and a non-steroidal anti-inflammatory.

Acetaminophen may also be started in the operating room in the form of a suppository. This combination is generally sufficient to provide effective pain control to (inaudible) and to allow them to look after themselves as well as their newborns post-delivery. Now occasionally with oral opioid such as codeine or oxycodone or even sometimes hydromorphone is added on as an as needed basis for breakthrough pain. But this opioid is seldom used, which reflects the success of the multimodal analgesic regimen in effectively managing acute post-cesarean pain.

Now though practices may vary between centers, what I described more or less seems to be the universal approach towards post-cesarean delivery analgesia.

Dr. James Rathmell: So the quadratus lumborum block has emerged as an alternate to spinal morphine in this setting. Can you briefly describe this block for listeners?

Dr. Faraj Abdallah: Certainly. The quadratus lumborum block is a relatively novel patient pain block whereby local anesthetics are deposited under ultrasound guidance, either lateral or anterior to or posterior to the quadratus lumborum block. These three locations correspond to three variants of quadratus lumborum block, also called type one, type two, type three or lateral, anterior and posterior.

The spread of the local anesthetics in that fascial plane seems to freeze the somatic branches of the thoracolumbar plexus that innervates the interior abdominal wall and may also spread into the (inaudible) space, providing the serial analgesia. The serial analgesia seems to be meaningful for treating abdominal pain associated with involution of the uterus and incisions to the uterus. And in this specific study, the focus is primarily on the quadratus lumborum one or the lateral quadratus lumborum, whereby anesthetics are injected lateral to the quadratus muscle.

Dr. James Rathmell: What was the hypothesis for this study, and how did you go about conducting the analysis?

Dr. Faraj Abdallah: We hypothesized that the use of quadratus lumborum block includes analgesic outcomes, namely pain at four to six hours post-operatively and cumulative 24 oral morphine equivalent consumption in patients having elective cesarean delivery under spinal anesthesia. And we chose the four to six hours window for assessment of pain because it captures the peak effect of the quadratus lumborum block and also it allows for that aggression of the neuraxial anesthetic use for surgery, to avoid any contamination of the effects of those two interventions.

As for the comparators, they varied according to the specific comparison conducted in the source studies. So pulling those studies had to account for that. And while we used random effects modeling for pulling results, we also certified according to the type of the comparison examined in the specific studies.

Dr. James Rathmell: So you made three comparisons in your analysis, spinal morphine versus spinal morphine and quadratus lumborum block. The second comparison was spinal morphine versus quadratus lumborum block alone. And the final comparison was no block, no spinal morphine versus quadratus lumborum block. So just a plain old spinal without a block versus the block. Now the two co-primary outcomes were post-operative 24 hour cumulative opioid consumption and pain at four to six hours. What did you find?

Dr. Faraj Abdallah: It may sound complex when describing this way, three comparisons with two primary outcomes. I think it's important to keep things simple in research and ask one question at a time and examine one variable at a time. But in this specific scenario with quadratus lumborum block, we found that the researchers attempting to evaluate the benefits of the block have used different study designs, three types of comparisons, as you just have described.

And using these different studies designs doesn't really lend itself to comprehension of the benefits of the intervention, nor does it facilitate integration into practice. We thus have to sub-group and analyze study based on their design. And the most important design is the one that matches our clinical practice and asks clinically meaningful questions. And this question, in my modest opinion is, does adding quadratus lumborum block to the care standard benefit my cesarean delivery patient? And the care standard in this instance is not the model analgesia inclusive for spinal morphine.

And the short answer to this question is no. There is no benefit whatsoever in any of the analgesic outcomes examined. The two other comparisons we alluded to involve eliminating a component of the multi-modal analgesic regimen, namely spinal morphine. Thus may incorporate some degree of bias, but may be meaningful in certain clinical scenarios. And to that end, if you are in a clinical scenario where you are unable to use spinal morphine or didn't use neuraxial anesthesia, then quadratus lumborum block may be clinically beneficial. And in this case, its analgesic efficacy seems to match that of spinal morphine. So can be used an alternative without having to tolerate the opioid related side effects.

Dr. James Rathmell: Well, that was a great summary, and I want to go through those results one by one for listeners. Your analysis included 924 patients in 12 separate trials. There were no significant differences in 24 hour morphine consumption and pain at 4 to 6 hours for spinal morphine when it was compared with spinal morphine plus the quadratus lumborum block. The second comparison was spinal morphine compared with quadratus lumborum block and there was no significant differences there. There were no significant differences in that comparison as well.

But when no block at all was compared with quadratus lumborum block, there were some modest improvements. Drop in 18 milligrams of (sounds like: cumulative) morphine equivalence over the first 24 hours and modest reduction in pain. The pain was a 48 hour area under the curve that did show just barely clinically meaningfulness in reduction in the total pain experience during that first 48 hours. What did you conclude from the analysis?

Dr. Faraj Abdallah: To clarify, the results that showed benefit are only those originating from trials that added quadratus lumborum block to a spinal anesthetic performed without spinal morphine. The benefits, although clinically important, may not be realistic. Yes, you can improve pain control and reduce opioid consumption, but only if you eliminate spinal morphine from your care standard. And we talk a lot about the importance of external validity, or the applicability of our study design to the real world.

That is that manage to demonstrate benefit did so only by eliminating an integral component of the care standard, which is spinal morphine. Thus they score low on the external validity. And such studies are very far from real world clinical practice and should have little impact on shaping our clinical practice or our clinical pathways. And realistically, I may still resort to quadratus lumborum block in certain scenarios, such as maybe a poor analgesia following a (sounds like: patchy) spinal or a crash cesarean performed under a general anesthetic. Or in a patient who cannot receive spinal morphine because of some contraindication or an allergy. But these are the exceptions that prove the rule, and the rule is the routine use of quadratus lumborum block for analgesia following cesarean delivery, is not supported by evidence.

Dr. James Rathmell: What were the limitations of your analysis?

Dr. Faraj Abdallah: I think the main limitations relate to generalizability. Our results are bound by the specific clinical scenario we examined, namely elective cesarean delivery or the (inaudible) incision performed under neuraxial anesthesia with long acting spinal opioids, which constitutes the mainstream practice. But at the same time these important limitations do not allow us to generalize the results to other surgical procedures or other analgesic regimes. For example, I cannot comment on the utility of quadratus lumborum block for open colorectal surgery.

Also mainly focused on quadratus lumborum block, because I think from a practical perspective it does not involve repositioning the patient laterally after a cesarean section. So all the researchers who conduct studies used the lateral quadratus lumborum, whereby the patient is allowed to stay supine for all practical purposes. Hence the results are confined to quadratus lumborum one or the lateral quadratus lumborum, and cannot be generalized to the other variants of the block. Furthermore, other limitations is our inability to examine some important patient-based outcomes, such as effects on return to function, ability to provide care to the newborn, effect on breastfeeding and even impact on persistent post-surgical pain. Primarily because the researchers who designed the studies that we reviewed did not examine these important outcomes, did not include them in their study design.

Dr. James Rathmell: Well, I was going to ask you next, what's the take home message for practicing anesthesiologists, but I think you've really summarized that well. So what comes next for you and your research team?

Dr. Faraj Abdallah: Well, our results are in no way an indication that quadratus lumborum block is useless. The other uses of quadratus lumborum block and other plane blocks, fascial plane blocks for abdominal surgery and other surgeries continue to be a focus of our ongoing research. As you know, we have had a lot of fascial plane blocks described recently and evidence of clinical utility is just starting to catch up.

Dr. James Rathmell: I hope today's discussion will lead many of you listening to read this new article that appears in the January 2021 issue of *Anesthesiology* where you can learn more about approaches used to provide post-cesarean analgesia and the role for quadratus lumborum block. Dr. Jon Wanderer from Vanderbilt and I also created an infographic that appears in the same issue and it's titled "C-Section Showdown: Spinal Morphine vs Quadratus Lumborum" where we highlight the primary findings of this study. Dr. Abdallah, thank you for joining me today and for the terrific explanations.

Dr. Faraj Abdallah: Thank you again Jim for this opportunity to address you and the audience and reach a bigger group of practitioners, researchers and knowledge consumers.

Host: You've been listening to the Anesthesiology Journal Podcast, the official peer reviewed journal of the American Society of Anesthesiologists. Check Anesthesiology.org for an archive of this podcast and other related content.