



Multimodal Analgesia Using Quadratus Lumborum Catheter for Pediatric Kidney Transplant: A Novel Approach



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INTRODUCTION

Postoperative analgesia after kidney transplantation presents significant challenges due to impaired kidney function and altered pharmacology. Multimodal analgesia, often featuring epidurals and opioids, is often employed. Minimizing opioids is advisable due to their association with delayed recovery, extended hospital stays, and increased mortality rates¹. Quadratus Lumborum (QL) single injection technique has been reported (reference). To date, there are no reports on QL catheters for pain management in kidney transplantation. We report a novel case, employing QL catheters in a pediatric kidney transplant patient, with notable patient comfort and reduction in post-operative opioid use.

Results

In the PICU, the QL catheter settings were as follow: ropivacaine 2mg/ml in normal saline at a rate of 7ml/hr, intermittent bolus of 4ml, bolus interval of 4 hours, and a 4-hour limit of 32ml. Clinician bolus was 4ml with a lockout interval of 120min. The patient received her first dose of opioid 1 hour after surgery (0.15mg hydromorphone). No repeat opioids were given until 24 hours later.

On postoperative day (POD) 1, the patient appeared smiling, engaging with an iPad, and reported 0/10 pain. She had successfully transitioned to a regular diet and ambulating without any episodes of hypotension. Pain was effectively managed with the QL catheter, acetaminophen, and hydromorphone patient-controlled analgesia (PCA). She pushed her PCA twice, for a total PCA use of MME 5.15 on POD 1. We discontinued her PCA, and transitioned to oral oxycodone. On POD2 through POD5, she received the following total doses of PRN hydromorphone: POD2 (MME7), POD3 (MME 7.5) , POD4 (MME 15), POD 5 (MME 7.5). The QL catheter infusion was stopped on the morning of POD3. No opioids were used after POD5. The patient was discharged on POD8.

Discussion

We report the first ever case of perioperative analgesia employing a QL catheter in a pediatric kidney transplant patient. At UPMC Children’s Hospital of Pittsburgh, QL single injection is typically employed as part of the analgesic regimen in kidney transplantation. This particular patient was without need for hemodialysis, did not have uremia, or suspected platelet dysfunction. In planning her care, we thought she would benefit from a QL catheter, as opposed to a single shot injection. This proved to be true. This case report demonstrates the potential benefits of QL catheter use, including zero opioids intraoperatively, and minimal opioid usage after surgery. The patient demonstrated early mobility and resumption of a regular diet. She was discharged early from the PICU with minimal side effects from the block.

Currently, there are no studies comparing QL catheters in pediatric kidney transplant patients to other postoperative analgesia options. QL catheter blocks have been studied primarily in adult literature; they provide effective visceral analgesia with long-lasting pain relief and a reduced opioid consumption². Compared to epidurals, QL blocks have fewer side effects: no motor blockade, less hypotension and graft failure. Although the pain relief achieved and time to narcotic initiation may be equivalent to that of an epidural, we believe that the reduced side effects and minimal opioid usage in this case warrant further research and consideration of QL continuous catheter blocks in pediatric transplant patients.

Opioids have known adverse effects. Prior efforts in opioid reduction in kidney transplantations have had variable success. Schwab et al, in their opioid reduction protocol, found patients to have a total OME of 75 from transplant to time of discharge³. In another study where continuous transversus abdominis plane block catheter was used in adults, total OME was fifty from transplant to time of discharge⁴. Our case highlights the benefit of the QL catheter in pain management for pediatric kidney transplant patients, and emphasize the potential for further research and application of QL catheters in pediatric transplant patients.

Case Report

The patient is a 15-year-old female who presented for a deceased donor kidney transplant. She weighed 32.2kg and measured 146.5cm in height. Past medical history was notable for bilateral kidney dysplasia resulting in chronic kidney disease, hypertension, and secondary hyperparathyroidism. For her kidney transplant, the acute pain service was consulted for perioperative pain management. After induction of general anesthesia, we placed quadratus lumborum-2 blocks (QL 2) using ultrasonography. On the right side, a 20-gauge QL catheter was placed through an 18-gauge 100mm needle (Image 1). On the left side, a QL single-shot block was placed using a 22-gauge 50mm needle (Image 2). [ropivacaine 0.5% (10ml and 8ml single injections) 90mg of 0.5%,]. Surgery and anesthetic course were uneventful. No opioid was used during the case. In addition to the local anesthetics via the QL’s, the patient received acetaminophen (300mg), ketamine bolus (20mg) followed by ketamine 5mcg/kg/min continuous infusion (total ketamine dose 60mg). The patient was extubated at completion of the case and brought to the pediatric intensive care unit (PICU).

FIGURES/IMAGES

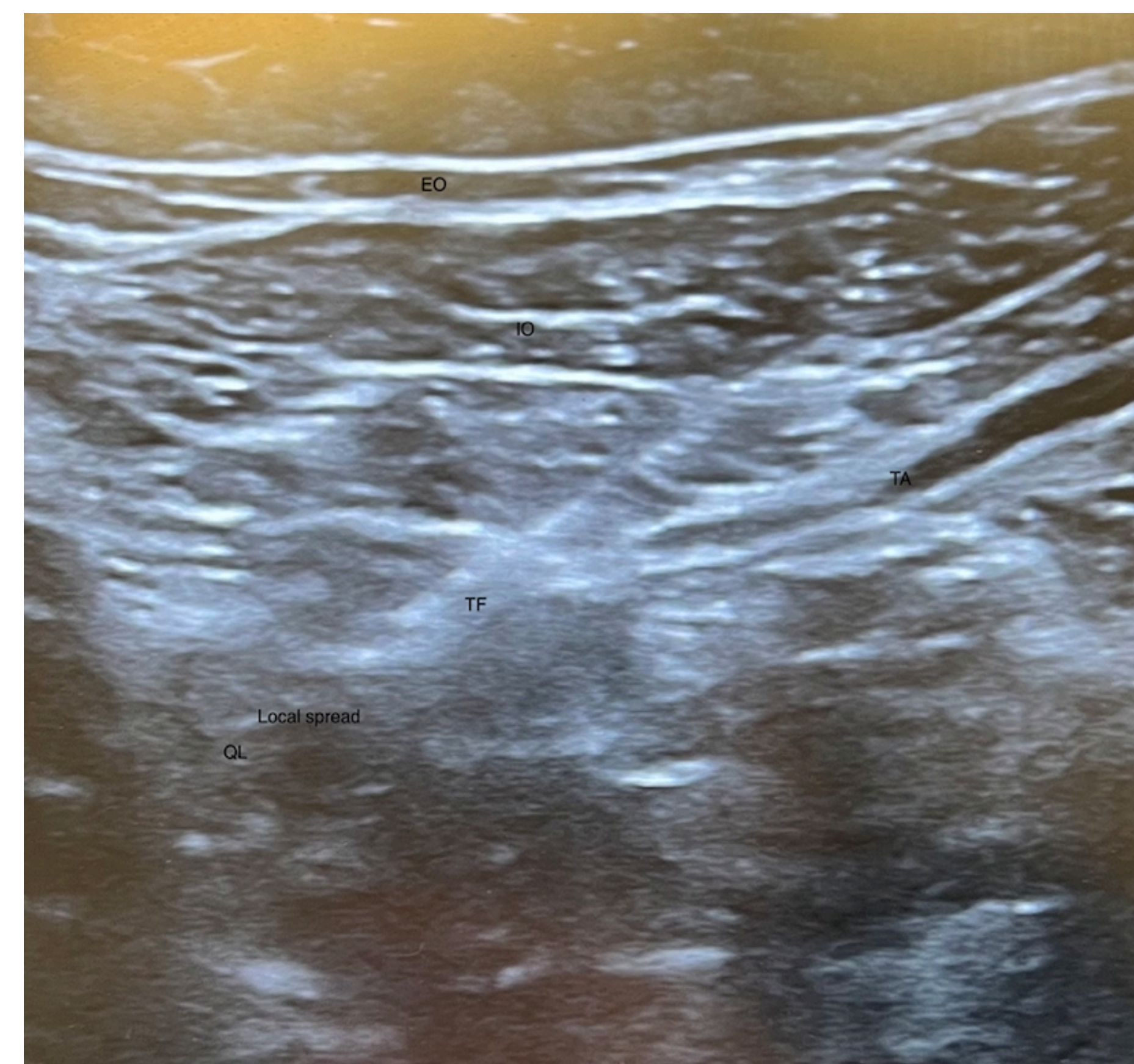


Image 1

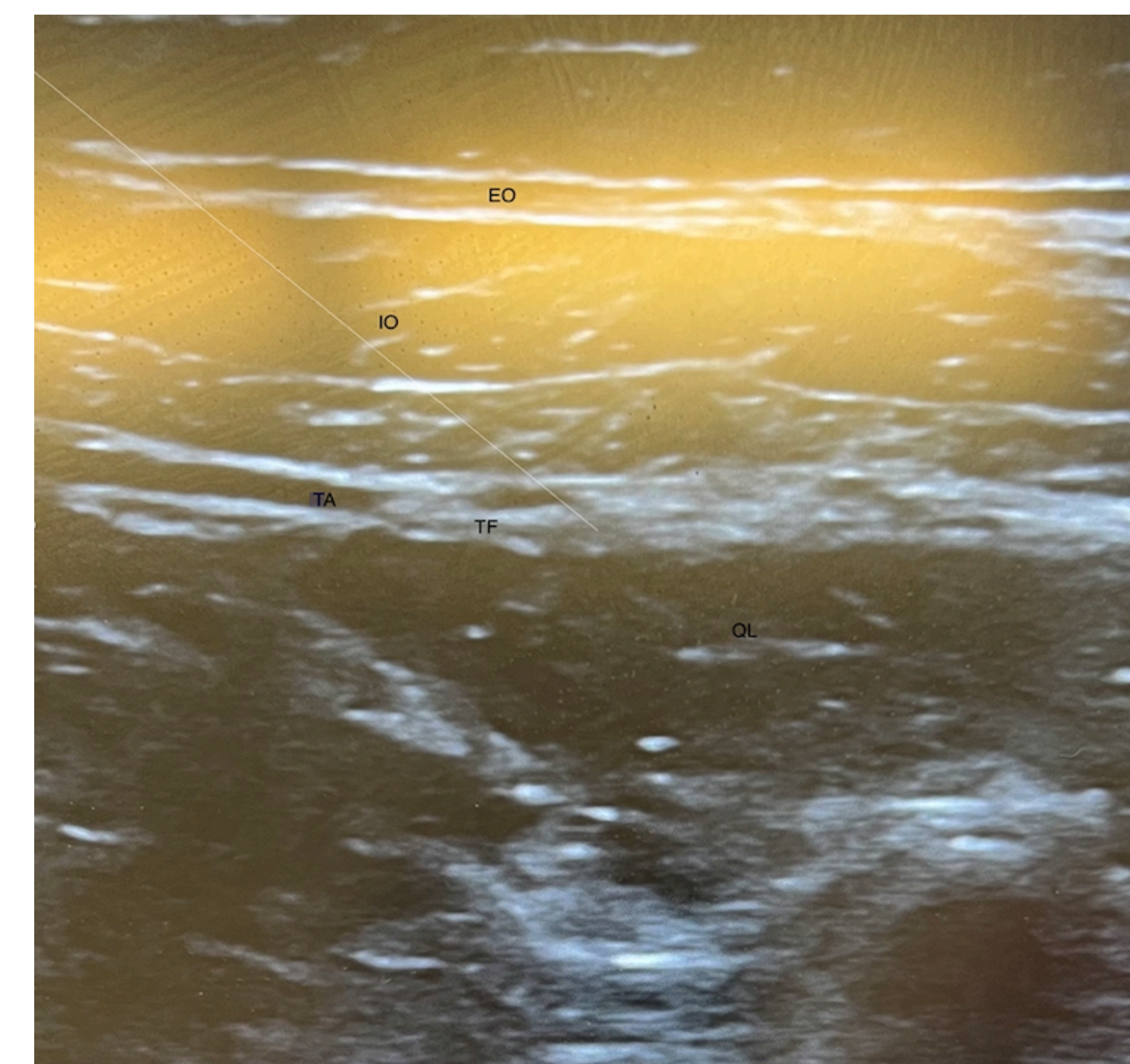


Image 2

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