CASE REPORT: Patient with Severe Restrictive Lung Disease, and Lumbar Syringomyelia, presenting for Total Hip Replacement: The Anesthesia, Ethical, and Professional Challenges.

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{NOTE BENE: For advanced learners and practitioners}
Comments, letters and editorials at the end.

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A. INTRODUCTION

There are two elements of interest in this unusual case. The first element concerns the patient's multiple co-morbid disease affecting her anesthesia care with high potential for perioperative mortality. A complex anesthesia care plan was required. The second element concerns the involved physicians in this patient's planned surgery-anesthesia healthcare, relating to medical ethics and professionalism.

B. THE PATIENT

An orthopedic surgeon referred his patient to an anesthesia pre-surgery assessment clinic, of a large American university academic hospital. This was 2 weeks before the booked surgery date. The patient was a 60-years old lady required a Right total-hip-replacement (R-THR). She was referred for pre-surgery optimization of her many significant co-morbidities, and the initiation of a good anesthesia plan. The pre-anesthesia assessing physician communicated with three departmental clinical anesthesiologists for (1) an opinion of the feasibility of anesthesia at all, and (2) for suggestions for an anesthesia plan. The anesthesiologist for the case on the day of surgery, was to be finally unassigned based upon their availability and willingness to perform the anesthetic.

The patient suffered from; (**1**) severe thoracic scoliosis from childhood. Surgery had been done for the scoliosis, with insertion of a single Harrington stabilizing spinal-column rod. The rod extended from C2 to L2. She also had; (**2**) post-polio syndrome causing severe weakness in her left arm, to the point it was useless. In addition, she had; (**3**) an Arnold-Chiari malformation at the base of her skull, with (**4**) cervical hydro-syringomyelia with a fluid-drainage tube into a cerebral ventricle, (**5**) a lumbar spinal syrinx extending into the cord conus, with a (**6**) tethered spinal cord. Her thoracic scoliosis caused her to have (**7**) severe restrictive respiratory disease with (**8**) chronic CO2 retention and mild respiratory failure. Her resting PaCO2 was 51.2 mmHg, PaO2 was 82mm/Hg, and art O2 sat was 90% while breathing room air, at night. Her forced expiratory volume for 1 second (FEV1) was 1.05 liter. Her weight was 52 Kg with BMI of 21. Additional diseases of lesser immediate concern were (**9**) osteopenia, (**10**) hyperlipidemia, (**11**) chronic anxiety, (**12**) gastroesophageal reflux disease (GERD), (**13**) chronic constipation, (**14**) nasal allergy with chronic sinusitis, and (**15**) feminine hormone deficiency.

In addition, the patient was considered a (**16**) post-operative thrombophlebitis risk. She took multiple nutritional supplements, as well as medications for all of the listed systemic diseases. In addition, she used nasal O2 supplementation and nasal BiPAP at night. Finally, the patient had strong wishes to receive regional anesthesia only, and to be awake during the surgery.

C. DEVELOPMENT OF THE ANESTHESIA CARE PLAN

Of the three anesthesiologists consulted, one did not respond with any proposal. One proposed placing a spinal catheter under fluoroscopy, for use as the sole anesthetic. The third anesthesiologist proposed a comprehensive combination of peripheral nerve-blocks feasible for awake surgery if all worked optimally, but preferably with a planned co-administered light general anesthetic with positive pressure ventilation and airway management, pending the patient's agreement after a face-to-face discussion with the anesthesiologist responsible for her care. The orthopedic surgeon was given a final report from the pre-Anesthesia assessment clinic. The third anesthesiologist, who had given the most comprehensive proposal, was assigned to the patient's care on the day of surgery, when he met the patient face-to-face for the first time.

In the day preceding the scheduled surgery, the surgeon did not respond to any contact efforts from the attending anesthesiologist for the patient's surgery, via the hospital pager system, to discuss and affirm concurrence (agreement) with the finalized anesthesia plan. Late on that same day before the surgery, contact was achieved with the senior surgery-resident trainee physician involved with the case. The trainee physician listened to the rationale behind the anesthesia plan, and agreed to it. He undertook to confer with his "boss", the operating orthopedic surgeon, and would communicate back to the anesthesiologist before surgery, should there be some serious objecting surgical reason for any aspect of the complex anesthesia plan. The anesthesia plan was entered into the medical records as the check-box option of general anesthesia with nerve block; "Gen w/block". Thus, it was fully expected the surgeon knew of the entire anesthesia plan, and had sufficient time to communicate again with the attending anesthesiologist about any details, had the surgeon so wished to do.

D. THE ANESTHESIA PLAN

After meeting the patient and winning their confidence on the morning of surgery, the assigned physician anesthesiologist was able to procure the patient's comprehending, and signed consent for an anesthesia plan of receiving three peripheral nerve blocks immediately prior to surgery, followed by transfer to the operating room for addition of light controlled general anesthesia and immediate commencement of the surgery. At completion of surgery the patient would be awoken and a comprehensive balanced multimodal analgesia plan would be sustained until the patient's hospital discharge.

The three nerve blocks were a subcostal nerve block, a parasacral sciatic nerve block, and psoas compartment block. Those three components would provide analgesia of the entire surgery field bones and muscles, as well as the full skin incision. Patient anxiety, general comfort and physiological functioning during surgery, would be managed with a light fast-recovery general anesthetic and positive pressure ventilatory support via an endotracheal tube.

Postoperative analgesia would have four phases:

- The first phase would be to have total analgesia from the nerve blocks during the surgery, and for 2 to 5 hours in the early post-surgical period. That would allow the light anesthetic to be administered, with opioid avoidance, and swift recovery of vitality and ventilatory ability. In addition, it would allow non-sedating non-opioid analgesic drugs to establish good tissue concentrations and pharmacological effect.
- The second phase would have substantial, although incomplete, nerve block analgesia of the dominantly surgically injured tissues beyond the first phase, via low grade psoas compartment block maintained via an infusion catheter, and a low concentration local anesthetic continuous infusion. Non-sedating non-opioid analgesia drugs would be administered on a fixed timed-schedule regardless of pain severity or even absence of any pain. The drugs were non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen, and gabapentin. Opioids could be used only, although cautiously, as rescue analgesia. That phase would end on the second morning with removal of the psoas compartment block catheter.
- The third phase would be focused on optimizing patient mobility and having them challenge their surgical pain with activity such as assisted walking. Oral opioids would be used as rescue analgesia only, for break-through severe-pain only, occurring despite the ongoing fixed-scheduled fixed-dose NSAIDs, acetaminophen and Gabapentin.
- In addition. there would be a substantive anti-hyperalgesia strategy. That strategy would have as its first step, comprehensive regional anesthesia analgesia with total effects extending at least a few hours after recovery from anesthesia, with a still substantive effect providing 80%+ analgesia through the first night after surgery. That would be the core part of pre-emptive analgesia. In addition, the second step was using specific anti-hyperalgesia drugs would be used. The most effective drug would be ketamine administered in small dose (25mg) before surgery during performance of the nerve blocks, 50mg with induction of general anesthesia and an additional 25 mg after very hour stopping once a total of 150mg was reached. Gabapentin orally, was administered for its additive, although small, anti-hyperalgesia effect for one month after surgery. The first gabapentin dose was given as a anesthetic-premedication.
- Overall use of opioids was planned to be very reduced, as compared to other practices.

E. ETHICAL AND PROFESSIONAL PROBLEMS.

The orthopedic surgeon only met and spoke to the anesthesiologist in the half-hour before surgery. The anesthesiologist was already half-way through performing the nerve blocks in a venue adjacent to the surgical suite. The surgeon and anesthesiologist spoke outside of the room with the patient. Only the sciatic nerve block remained to be injected. The fact the surgeon only communicated his objection to the sciatic nerve block so extremely late in the patient's care was a problem. The anesthesiologist had communicated the plan details 2-weeks earlier to the pre-surgery assessment clinic, annotated that fact into the surgery-scheduling system that the surgeon had access to, attempted to speak personally to the surgeon via pager message, and then finally spoken via the surgery trainee-physician who conveyed the plan to the surgeon on the previous day. In fact, it was the surgeon himself who had referred this complex ill patient for a special pre-surgery assessment, that initiated the special anesthesia-care plan. The surgeon if truly ignorant of the planned sciatic nerve block component of the patient's care, could not blame the anesthesiologist for that fact.

The surgeon was re-informed of the anesthesia care plan and its progress at that moment. He then expressed strong dislike for the sciatic nerve block component about to be performed, and used the phrase "I don't want it!" The anesthesiologist explained that to obtain the patient-benefit of opioid sparing after surgery, and the attainment of light general anesthesia with near-immediate full restoration of patient vigor and best breathing immediately after surgery, the nerve blocks had to fully anesthetize all of the operated tissues. The surgeon could not provide a scientific or surgery-specific reason to not perform the sciatic nerve block other than he "did not like it", and elected to step away from the discussion. He was unwilling to converse any further. The anesthesiologist then returned into the procedure room and performed the sciatic nerve block.

E-1 ETHICAL CHALLENGES DISCUSSION:

A number of issues and questions now arise. Brief discussion will be held on each point.

- **Has the surgeon agreed to the anesthesia plan, or not?** The fact the surgeon walked away can be inferred to be a passive consent, with actual acceding to the anesthesia plan. That is thus interpreted as fully permitting it, and equally thus agreeing to it. The surgeon, in the case of an anesthesiologist and a surgeon not agreeing to a coordinated care plan for surgical patient, had the option of speaking to the operating room physician manager (OR manager). That OR manager, of that institution, had the option of either (a) speaking to the anesthesiologist and obtaining his/her points of view, and or (b) making an emergency assignment of an alternative anesthesiologist to take over the patient's anesthesia care, if such a suitable person was available at that moment.
- **Does the surgeon have any absolute right to object to a particular anesthesia-care plan?** It can be argued that surgeon does have such a right. There are complex logistical issues within the discussion. If the surgery is elective and can be safely deferred to a later time, pending obtaining an alternate and agreeing anesthesiologist, that would be the surgeon's privilege to so choose. In this case half of the nerve blocks had already been performed. In addition, the patient was now lightly sedated in order to provide her with comfort during the injections, and she was no longer able to participate in the discussions and provide a legally valid new medical consent to an alternate care plan with associated different medical risks.
- **Does the anesthesiologist have an absolute obligation to comply with surgeon directions concerning the formulation of the anesthesia care plan?** The ethical answer is no. The anesthesiologist stands alone responsible for his/her actions in generating a consequence secondary to some element of the anesthesia care plan that was performed or omitted.
    - A counter point is the question: What if the surgeon insists an element of the anesthesia care plan be altered, for surgical-medical reasons which the surgeon presents with clarity and elaboration? The anesthesiologist can then defer to the surgeon's surgical expertise, and he/she should in civil and criminal court be exempted from responsibility for any medical consequence flowing from the care plan alteration. The surgeon, of course, then inherits and in fact actively takes on that specific responsibility. In reciprocal fashion a physician anesthesiologist may communicate objection to the surgeon, to an element of the surgical care plan, with rational medical argument. The surgeon then, if not acceding to the point raised, the surgeon is entitled to personally make a final decision on the surgical matter raised. Should the surgeon persist in the objected-to course of action, the surgeon then acquires added liability for identifiable consequences of that specific action.

E-2. The surgeon a few years after this case was successfully operated and anesthetized, presented argument for the anesthesiologist to be fired for reason of not deferring to his surgical instructions in this case. The surgeon believed he had final authority on every aspect of medical care of a surgery patient, including the minutia of anesthesia-care, despite his lack of training and experience in anesthesia care. That belief stands in conflict of what is taught in most first world healthcare systems. It is taught that both a surgeon and an anesthesiologist are equally trained physicians, although each only expert within their own fields. For the perioperative period, the surgeon does not solely *own* the patient concerned, nor have final authority on every single aspect of *anesthesia care*. It is a shared-care patient with both physicians providing patient-care simultaneously to the one patient, in a cooperative team fashion. Equally, the anesthesiologist also does not ever *own* the patient concerned, nor have final authority on every single aspect of the surgical care. Undergoing surgery is a very critical period for a patient requiring close coordination, collaboration, and team work between the surgeon and the anesthesiologist. That requires full and mutual respect of each specialist physician for the other different specialist physician. It also requires open *uninhibited and unintimidated communications lines* at all times between the surgery team and the anesthesia team. For a very large part of medical care in the broader world, that situation prevails exactly so. Sadly, that situation is not however universal. In some surgery-anesthesia situations, and communities, particularly those utilizing non-physician anesthesia services, the surgeon has final decision-making authority on all aspects of anesthesia care.

F. THE ANESTHETIC-ANALGESIA PLAN, AS CARRIED OUT.

During performance of the nerve blocks the patient was provided with supplementary nasal oxygen, and standard ASA vital sign monitoring was used. For patient comfort ketamine 25mg IV was administered with midazolam 0.5 mg IV. The midazolam dose was repeated once.

The subcostal nerve block was injected using 10 ml of 0.5% ropivacaine. Injection was done using a 90 mm Quincke point 22G spinal-block needle. See figure #1.The local anesthetic was injected subcutaneous along a line as illustrated in Figure #1. The drug was injected deep to the subcutaneous fat, but superficial to the fascias. The purpose of this block was to provide analgesia of the surgical skin incision, that reached cephalad to the dermatome of the lateral cutaneous nerve of the thigh (LCNT). The ropivacaine was expected to provide 3 to 5 hours of anesthesia. The pain from the subcostal nerve dermatomes after the block wore off was expected to be modest to minimal and well treatable with non-opioid analgesic drugs.

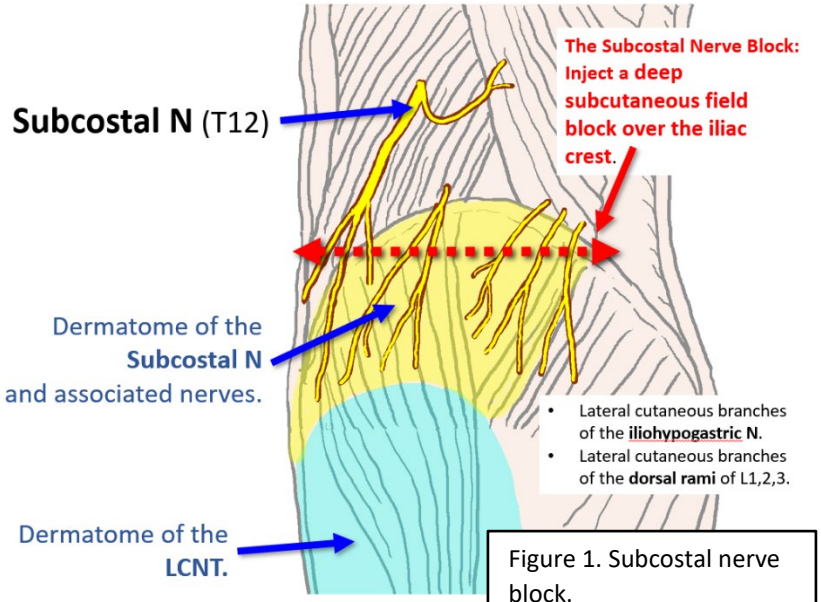

Figure 1. Subcostal nerve block.

The psoas compartment block was performed with the patient in the lateral position, surgical-side up, using full gown, mask, and drapes sterility, following the DeKrey landmarks[i],[ii],[iii]. The psoas block is injected 3cm lateral to the midline at the L3 vertebral level into the psoas muscle immediately deep to the transverse process. Prior lumbar spine X-rays were had been examined to visually exclude any suggestion that the presence of the lumbar cord syrinx and cord tethering had not widened the spinal canal grossly, thus pushing the transverse process and intervertebral orifices to lateral as well. Such an event would have required altering the psoas compartment block landmarks, so as to inject that block slightly more lateral too. The bony anatomy on Xray appeared to be normal, in the contexts under examination.

The third lumber spinous dorsal-process was identified using two surface landmarks; (1) counting upwards from Toufier's line which identified the L4 dorsal process position, and (2) counting downwards from the T12 dorsal spine. The T12 dorsal spine is identified by first palpating the 12th rib in the mid-Axillary line and then tracing a line, a finger's breadth wide, just caudad to the rib and parallel to it, back to the midline. The line crossed the T12 dorsal spine in the midline. The T12 dorsal spine position was marked on the skin with a pen. See Figure #2. After the L3 vertebral dorsal process was confidently identified, it was also marked on the patient's skin. Finally, a point was measured off with a ruler, exactly 3cm due-lateral from the L3 dorsal spine, towards the side of the planned R-THA

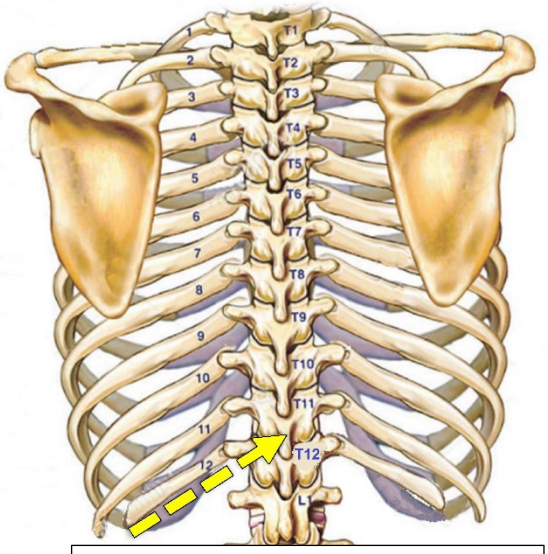

Figure no. 2. Identifying the T12 dorsal process, using the 12th rib.

Full sterility with gown, gloves and drapes was used. A 80mm long 17G Tuohy needle from an Arrow Stimucath® set was inserted through the final parasagittal skin mark that was 3cm direct to lateral from the L3 dorsal spine, on the surgical side. Se figure #3. The needle was advanced strictly direct towards anterior, so at all times to be a parasagittal plane exactly 3-cm off midline.

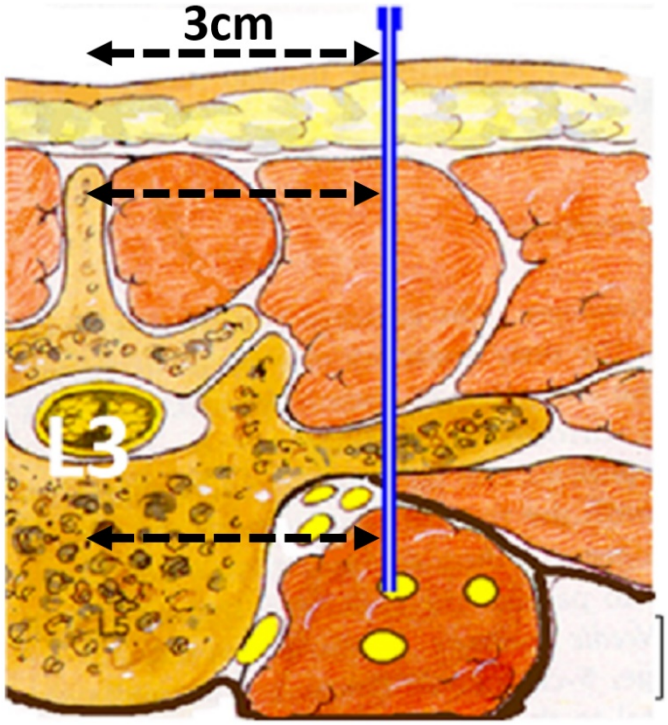

Figure no. 3. Psoas compartment block.

Needle redirection slightly towards cephalad or caudad was used to seek the L3 transverse process. The needle tip remained precisely within a parasagittal plane at all times, exactly 3cm off the vertebral column midline. In other words, the needle never deviated to the left or to the right. When the needle tip was confirmed to be in contact with the L3 transverse process, by the operator's tactile sensation while holding the needle, the needle was "walked off" the transverse process caudad edge.

Then five end-points for needle advancement, were sought as the Tuohy needle was advanced off the transverse process, towards anterior The needle-advancement endpoints were the first confidently identified one of any of the five end-points; (1) A tactile feeling of fascial "pop" as the blunt Tuohy needle penetrated it, beyond 1 cm beyond the transverse point, (2) When beyond 1cm beyond the transverse process a Loss Of Resistance (LOR) to the injection of saline using appropriate syringe occurred, (3) seeing any leg motor twitch anterior on the patient using a 2 mAmp stimulating current via the needle, (4) A distance of 2cm beyond the transverse process is reached, and (5) the patient reports any strange sudden sensation in the leg (paresthesia). On this patient, as the nerve block needle tip was advanced, to reach a depth of 1 cm beyond the transverse process, and towards anterior, three observations were suddenly *simultaneously* made. A fascial "pop" was felt via the needle, a loss of resistance to injection occurred, and a motor twitch developed in the thigh. Needle advancement was ceased, and a perineural soft-tip type catheter was inserted via the needle into the psoas muscle compartment for 3-cm length beyond the needle. Fifteen milliliters of 0.5% ropivacaine was injected via the catheter, after standard injection safety tests were performed. This was a smaller drug volume than usual for adults for this block, due to the patient's small weight of 51kg, as well as the need to share the judged safe maximum amount of local anesthetic across three nerve blocks.

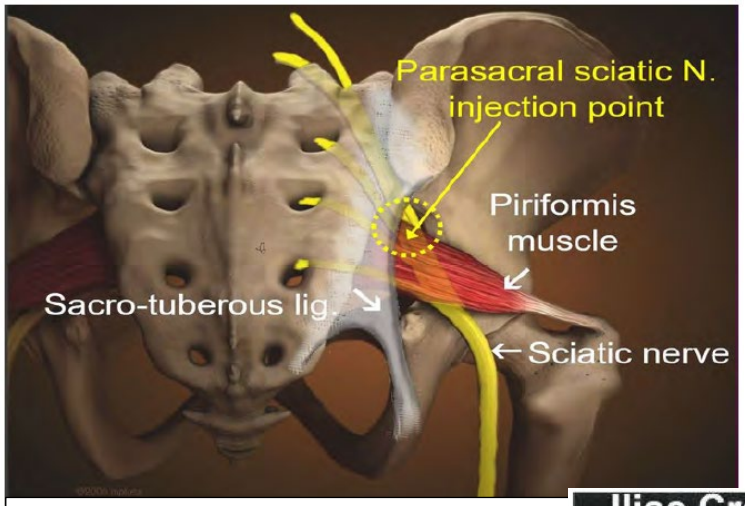

Figure no. 4. Posterior view of the buttock region a
injection point for the parasacral sciatic nerve bloc

A parasacral Sciatic nerve block was performed next. See figure #4. The advantage of this nerve block is that a number of other nerves supplying all the muscles immediately posterior to the hip joint capsule are also blocked, as bonus secondary nerve blocks. This block, although named after a single nerve, is thus really a lumbar sacral plexus type of nerve block. A line was drawn upon the skin joining the Posterior Superior Iliac Spine (PSIS) to the ischial tuberosity.

Then a mark was made 1/3 of the line's length, from the PSIS, upon the line. That was the insertion point for the nerve block needle. See figure #5. A stimulating nerve block needle was advanced directly towards anterior and the sciatic nerve was located, via an elicited motor twitch in the sciatic nerve distribution a hamstring motor twitch was observed. A single injection of 15 ml of 0.5% ropivacaine was made. It was expected that that would provide 4 to 6 hours of profound analgesia. Thereafter, any pain posterior to the hip joint would be moderate and very well

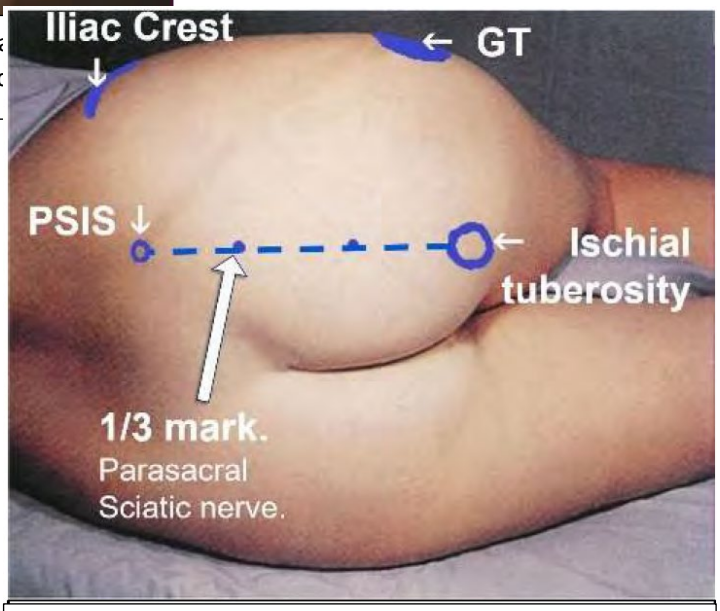

Figure no. 5. Landmarks for the parasacral sciatic nerve block.

treatable with non-opioid multimodal analgesia.

Following completion of the three nerve blocks, the patient was transferred to the operating room for induction of general anesthesia. Induction drugs were ketamine 50mg, fentanyl 75 microgram, and 30 mg rocuronium with esophageal intubation. Anesthesia was maintained with N2O gas and Desflurane volatile anesthetic drug. The surgery and anesthetic were uneventful, took 5 ½ hours, and blood loss reduced the preoperative hemoglobin from 13.5 to 6g/l by the 1st morning. Via the psoas compartment catheter, a top-up injection was administered 2h30min after surgery had started, and again at conclusion of surgery another 2h30min later. The doses were each 20ml of 0.5% ropivacaine. After surgery a psoas compartment infusion of 0.2% ropivacaine at 10ml/h was initiated. The catheter was removed the first morning after surgery. Full routine antithrombotic therapy was initiated later that first evening.

The patient reported having zero pain upon first awakening, and through the first night after surgery. Pain was reported as 2/10 through the first full day after surgery and recovery was swift and uneventful. Medical records for the next four years indicate the hip replacement was very satisfactory, and the patient was as generally well as they had been before the surgery. The only surgical induced nerve-injury caused a hip anterolateral thigh skin numbness that lasted an undetermined period. The nerve was certainly the lateral cutaneous nerve of the thigh or part of it. That nerve injury resulted from either the surgical skin incision, or injury from the surgical retractor and the extended unusually long duration of surgery.

G. CONCLUDING DISCUSSION.

A spinal block was considered as absolutely contraindicated for 2 reasons. Apparently, that was the anesthetic that the surgeon had expected. Due to the Arnold-Chiari malformation if any spinal CSF fluid leaked via the dural-puncture point, and in a significant degree, and if the intracranial pressure was raised for any of multiple reasons, including just having sustained coughing after surgery, the brain stem could herniate via the foramen magnum, with certain patient death to follow[iv]. Any epidural block is always also absolutely contra-indicated, if a sub-dural block (Spinal block) is considered absolutely contra-indicated. No epidural block can ever be done that is absolutely free of risk for a dural-puncture accident.

General anesthesia on its own, would seem to be safely manageable for the patient, until the conclusion of surgery. The issues of severe restrictive respiratory disease and night-time respiratory failure is easily handled under anesthesia via controlled ventilation. The big challenge is how to manage those two illnesses after surgery, during the period of residual anesthetic drug effects, compounded by the need to simultaneously treat the severe post-surgical pain predominantly with opioids. The problem could be deferred to a later less severe time by extending the period of the patient's ventilation overnight in an intensive care unit. Although very unideal, that could be an acceptable but risky plan in healthcare systems, where top-skilled anesthesia services are unavailable, and no surgery at all is the only alternative care plan for a patient identical to this. The patient would also need to consent to this plan with full given-information on the real mortality odds of death from the surgery, anesthetic, and analgesics.

Peripheral regional anesthesia is a very feasible option, if appropriately nerve-bloc-skilled anesthesia providers are available. The required skills in peripheral regional anesthesia are not basic anesthesia skills and only advanced specialized practitioners who remain in regular practice of the very specific required nerve blocks, are suitable persons. The following hypothetical regional-anesthesia options can be considered:

- **Infiltration techniques**, as used by some surgeons for partial postoperative analgesia, are severely deficient for awake surgery. There is no safe degree of supplementary sedation and analgesia that could make such techniques usable, and preserve the life of the patient. The sedation and analgesia doses that would stop the patent moaning and moving would also kill the patient via respiratory depression superimposed on top of the patient's severe restrictive respiratory disease and mild ventilatory failure, thus precipitating life-critical respiratory failure. Equally the infiltration techniques, even if combined with general anesthesia, still require much administration of opioids after the surgery. This patient needed to have post-operative opioid-minimization as a top priority
- **Peripheral nerve blocks**. Three specific nerve are needed. (I) A subcostal nerve block to cover the part of the skin incision from near the iliac crest down to about the greater trochanter's level. (II) A very proximal injected sciatic nerve block, with bonus extra block of supplementary nerves to all the tissues on the posterior aspect of the hip joint. Even if these tissues are not incised by a scalpel, they will still be sufficiently harshly handled during surgery, to still need anesthesia, even with anterior approach hip arthroplasty. (III) Psoas compartment block. This last block, if optimally performed, will anesthetize the lateral cutaneous nerve of the thigh, the obturator nerve, and the femoral nerve. Anesthesia of all three of those nerve is absolutely needed for any surgical approach hip arthroplasty.
    - A technical challenge is that the optimal local anesthesia drug-volumes and drug-concentrations for the sum of those three peripheral nerve blocks is at the limit of what is tolerable for a full-size patient. If one restricts the drug volumes and concentrations to what is considered the least amounts and lowest concentrations that could produce surgical anesthesia, the risk of a technical nerve block failure increases to about 50%. In addition, the nerve blocks would set up very slow, thereby (a) delaying the surgery causing operating room management logistical problems, and (b) have a very limited duration of analgesia that would have near no post-surgical benefits. This patient was small in stature having a weight of only 51 kg and Body Mass Index (BMI) of 21. That emphasized the need to be very judicious in setting a safe maximum total local-anesthetic drug dose (volume x concentration). That also necessitated the need for simultaneous general anesthesia with ventilatory support.

For a patient suffering from severe restrictive lung disease, mild respiratory failure with chronic hypercarbia, Arnold Chiari syndrome and cervical syringomyelia with a ventricular drain, post-polio syndrome involving one arm severely, and lumbar syringomyelia with a tethered spinal cord, and then needing surgically challenging total hip replacement, the anesthesia-analgesia care plan given was highly satisfactory, for the patient. The most feared complication for this lady was death, either intraoperative or equally postoperative.

The altered anatomy of the lumbar spinal region created uncertainty of how far caudad the spinal cord extended[v],[vi]. A normal spinal cord ends at L 2 and intrathecal (spinal) blocks are considered safe when performed caudad to the termination of the spinal cord. Tethered spinal cords typically cause the spinal cord to extend even to L5 or lower. A spinal anesthetic injected proximal (cephalad) to the termination of the spinal cord creates a real risk of an intraspinal cord injection occurring from both an intrathecal (spinal) injection or a lumbar epidural injection. Such an event would destroy the distal spinal-cord permanently causing significant permanent leg weakness, if not full paraplegia. In addition, either an

intentional dural penetration with any needle size (spinal block), or an accidental penetration with a large epidural needle all create the risk of Cerebro-Spinal Fluid (CSF) leakage. CSF leakage in the presence of brain-skull Arnold Chiari syndrome create the possibility of a cerebral herniation through the foramen magnum and death[vii],[viii]. Clearly neuraxial anesthesia had to be very strongly avoided[ix].

For a patient suffering from severe restrictive lung disease and having chronic respiratory failure, needing permanent nocturnal supplementary oxygenation and BiPAP ventilatory support, the use of large doses of opiates for post-surgical analgesia would cause death with high likelihood, unless the patient was electively ventilated in an Intensive Care Unit (ICU). Such ICU care would induce of its own risks, being delayed mobilization of the patient with increased risk for critical veno-thrombosis and long sustained inability to be weaned from ventilation with a high risk for fatal lung complications.

The use of comprehensive peripheral nerve blocks to achieve total analgesia for the surgery, and for meaningful postoperative period was feasible, and safe despite the surgeon's objections. The first advantage of additionally using light general anesthesia was that it allowed full ventilatory support that any significant level of sedation would have triggered a need for anyway. The second advantage of the accompanying general anesthetic to the nerve blocks, was that it allowed block doses to be minimalized modestly, without concern for slowness of block onset or risk incomplete block. It could be argued that the anesthetic was also an opportunity window, to administer additional ketamine for its potent anti-hyperalgesia effects, without having to deal with the ketamine psycho-side-effects.

Full nerve blockade of the hip joint always requires a multiple nerve block combination in order to achieve complete anesthesia and total analgesia. Omission of one major component nearly obliterates the benefits of the remaining performed nerve blocks fully. It is a fact that surgeons have great concern for surgically injuring the sciatic nerve during hip arthroplasty. The risk is about 0.5%. A nerve block does not alter that surgical risk. Surgeon's like to document into the health record of the patient, that there is a functioning sciatic nerve on the same patient side as the hip replacement surgery, as soon as possible after the patient is awake after surgery. That is for their own defense in a potential medicolegal litigation case. Early documentation of the injury *suggests* they were at all times concerned to avoid such an injury, and are thus less likely to be judged guilty of any negligence in the nerve injury's etiology. They key point is, the early discovery of a surgical sciatic nerve injury does not lead to any dramatic nerve saving or nerve rescuing intervention or medication for the patient. Now if a sciatic nerve block was performed for the surgery, the nerve will still be anesthetized for a period after the surgery and the ability to examine the nerve's function will be delayed by 3 to 12 hours. That causes the surgeon to worry for him or herself. It does not alter the outcome of surgical nerve injury, nor the likelihood of a sciatic nerve surgical injury, nor even alter a sciatic nerves treatment. It is simply and only good *defensive-medicine* to discover complications of medical care as soon as possible. That is foremost in the surgeon's interest, and not the patient's interest.

The surgeon who had objected so much to this patient getting a sciatic nerve block was not primarily concerned for the patient. The surgeon was wanting to practice defensive medicine out of concern for himself. It is universally agreed that defensive medicine is not in any patient's interest when it is the logic to alter medical care of the patient in a way that is subtly negative for the patient, to preserve the surgeon's efforts at fostering an erroneous enhanced PERCEPTION of being a good doctor. This surgeon had a peer surgeon who had once surgically injured a patient's sciatic nerve during a total hip arthroplasty (THR) a few years earlier. That lead to an emotionally very traumatic litigation case against the surgeon. That strongly created a heightened fear of sciatic nerve injury following THR amongst the institution's arthroplasty surgeons. One of the group of surgeons had stated that there is also a risk that nerve block

can cause a sciatic nerve injury and the group of arthroplasty surgeons feared the surgeon could get unfairly blamed for that anesthetic complication. The risk of sciatic nerve-injury in modern times following best practice nerve block routines is not zero. The true incidence is unknown but in the range of 1 in 5000 cases to 1 in 100 000 cases. This patient's chances of dying from a suboptimal anesthesia-analgesia plan was estimated at up to a 50% chance. This case-report patient needed that sciatic nerve block, that the anesthesiologist insisted upon administering, as a critical part of a best anesthesia plan.

This case report thus illustrates the successful use of a comprehensive peripheral nerve block combination, and anti-hyperalgesia medications conjointly with general anesthesia in a patient undergoing a THR surgery, who had critical central nervous system pathology prohibiting neuraxial anesthesia, and also had critical ventilatory and respiratory problems prohibiting an opioid dominated post-surgical analgesia plan. The surgeon, unnecessarily, created some ethical and professional problems about the anesthesia-analgesia patient-care plan, that were discussed. The necessity for anesthesia providers to have clinical autonomy over technical anesthesia decisions is not respected by some surgeons, at the potential cost of increased patient morbidity and mortality.

The author has no material or financial conflicts of interest in this case.

The case is reported in educational and patient safety interests.

No specific patient consent is possessed for the reporting of this case

The patient's identity is concealed.

Questions and comments may be sent to the author, and may be included after this report text, on J-RAC (www.regional-anesthesia.com).

A full and referenced unsolicited opinion editorial (Op-Ed) on any aspect of the case will also be considered for publication on J-RAC

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The author completed 2-years study in mathematics, genetics, psychology, and computer science before transferring to Medical school. The medical degree was a 6-year course with 2-years additional clinical experience needed for full medical licensing. He then completed two additional degrees in primary care medicine, family medicine and emergency room medicine whilst working as a remote rural medical practitioner for 7 years. In that time, he delivered 700 babies, performed 150 Cesarean sections and did other small surgeries, as well as performed general anesthesia, and performed pediatric and geriatric general medical care. That was followed by four years full-time study as an anesthesia resident/registrar, with attainment of two qualifications in anesthesia. He developed a big interest in regional anesthesia, and founded a national regional anesthesia and pain therapy society. He practiced specialist anesthesia in the private healthcare system for 13 years whilst making national and international poster presentations and giving lectures. Whilst in private practice he also managed monthly morbidity and mortality academic discussion evening for anesthesiologists working in a metropolis of 7 million citizens, presented 18 workshops annually for hands-on regional anesthesia classes in anesthetized pigs. He convened national and regional anesthesia meetings annually, and was awarded a solid silver medical for contributions to anesthesia education. Apart from advancing regional anesthesia he taught and practiced vascular anesthesia. He also had interest in medical ethics and professionalism, once convening a special session at a national conference. This period was followed by a 12½ year teaching job at an American medical school with attainment of full professor rank, before clinical retirement. He still actively continues to lecture and publish in regional anesthesia, and general topics.

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Letters, editorials, comments:

COMMENT 2021-5-1; Professor Vincent Chan: *This is a very challenging case with many learning points and interesting discussions. It is best suited to advanced learners and practitioners*.