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Case Report

Taylor's (lumbosacral) approach for spinal anaesthesia in a patient with extensive active psoriasis undergoing skin grafting: a case report

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ABSTRACT

For lower-limb surgery spinal anaesthesia, via the conventional midline or paramedian lumbar route is the preferred method; however, extensive plaque psoriasis present as a unique challenge, because needle trauma through diseased or scaly skin offers a theoretical risk of local infection and causing new psoriatic lesions at the puncture site through the Koebner (isomorphic) phenomenon. This case describes a 20 years old female came for superficial skin grafting over the raw area of the amputated above knee stump. She was haemodynamically stable and scheduled for spinal anaesthesia; however, examination revealed active, confluent psoriatic plaques over the entire back, that's why standard midline or lumbar paramedian puncture was not possible. As patient denied for general anaesthesia (GA), spinal anaesthesia was successfully administered using Taylor's lumbosacral technique through the L5-S1 interspace, which target a comparatively sparing area of skin away from the extensive truncal plaques. The block provided sufficient sensory and motor anaesthesia for the procedure, which was finished uneventfully with stable hemodynamics and no cutaneous or neurological problems at the puncture site on follow-up. Taylor's approach, classically described for anatomically challenging spines, can also a useful alternative window for neuraxial blockade when the traditional lumbar puncture site is compromised by active dermatological condition like psoriasis. This allows safe regional anaesthesia while avoiding both sick skin and the morbidity related to GA.

Keywords: Taylor's lumbosacral technique, Spinal anaesthesia, Extensive plaque psoriasis, Koebner phenomenon

INTRODUCTION

Spinal anaesthesia is the most common method for lower-limb, perineal and infra-umbilical surgery and which is often administered using a midline or paramedian route at the L3-4 or L4-5 interspace. Sometimes, this usual route is challenging or unsafe due to pathology of the spine itself (degenerative illness, scoliosis, ankylosing spondylitis, previous instrumentation) or, less frequently, by disease of the overlaying skin at the targeted puncture site.

Well-defined erythematous plaques with silvery scaling are the hallmark of psoriasis, it is a chronic, immune-mediated inflammatory skin disease usually affects the trunk, scalp and extensor surfaces and in severe cases, can also cover a significant portion of the back.[1] A well-known characteristic of psoriasis is the Koebner (isomorphic) phenomenon, in which new psoriatic lesions forms at areas of skin trauma including scratches, tattoos, burns and surgical or needle wounds. Localized infection at the site of skin puncture is an absolute contraindication to neuraxial anaesthesia and inserting a needle through actively diseased, scaly or fissured skin raises both a practical concern about asepsis and a theoretical concern about creating a new psoriatic plaque at the puncture site.[2]

Taylor's approach, first described in 1940 as a technique for lumbosacral subarachnoid puncture, is a modified paramedian technique that accesses the subarachnoid space through the L5-S1 interspace-the widest interlaminar space in the vertebral column and the one least frequently destroyed by degenerative change.[3] Since then it has been applied successfully in patients with anatomically challenging spines such as those with scoliosis, and in the situations where other parts of the back are unsuitable for needle insertions.[4-6] This case describe its application to a young trauma patient need regional anaesthesia for skin grafting in order to prevent extensive active psoriatic plaques across the back.

CASE REPORT

A 20-year-old woman, weighing 63 kg, came in for superficial skin grafting to a raw area over the right above-knee amputation stump. One month prior she sustained a road traffic accident which had left her with a fracture of the right femoral shaft, a both-bone fracture of the right leg and a left posterior malleolar fracture. On the second post-injury day, she underwent emergency surgery under GA which comprising external fixation of the right femur and right above-knee amputation for the non-salvageable limb. She had minimal sore throat post operative period, which got relieved with lozenges and nebulization with budesonide for two days. Other than that, her recovery was uneventful and now she was hemodynamically stable and eligible for the scheduled grafting procedure.

On preoperative evaluation revealed that patient was of ASA physical status II, with no obvious abnormalities in airway, cardiovascular and respiratory examinations as well as unremarkable hematological and biochemical investigations. In view of patient's refusal for GA, the site of surgery and to avoid a further general anaesthetic complication, spinal anaesthesia was planned. On the other hand, general examination showed active, confluent, well-defined erythematous plaques with silvery scaling covered nearly entire back, including the traditional lumbar puncture site, consistent with active plaque psoriasis. As per dermatology opinion; needle placement through the actively scaling plaques was considered undesirable because of the risk of local infection, difficulty in obtaining sufficient skin asepsis and the potential to triggering new psoriatic lesions (Koebner phenomenon) at the puncture site.

Following discussion with the patient, informed consent was taken for both spinal anaesthesia via an alternative method and publication of the case. The lower back and sacral region were re-examined to find the area with the least active disease, which was found to be near below the L5-S1 level. For the above reason, Taylor's (lumbosacral) approach was chosen.

Technique

The patient was seated with her the back flexed. Once, the posterior superior iliac spine was located, the needle insertion point was marked around 1 cm medial and 1 cm inferior (caudal) to it, over skin comparatively free of active plaques. With all aseptic skin preparation and local infiltration with 2% lignocaine, a 25-gauge Quincke spinal needle was inserted at the marked point and then guided medially and cephalad at an angle of almost 45–55° to reach the L5–S1 interlaminar space (Figure 1). At second attempt there was free flow of clear cerebrospinal fluid, following which 15 mg (3 ml) of injection hyperbaric bupivacaine 0.5% was administered intrathecally.

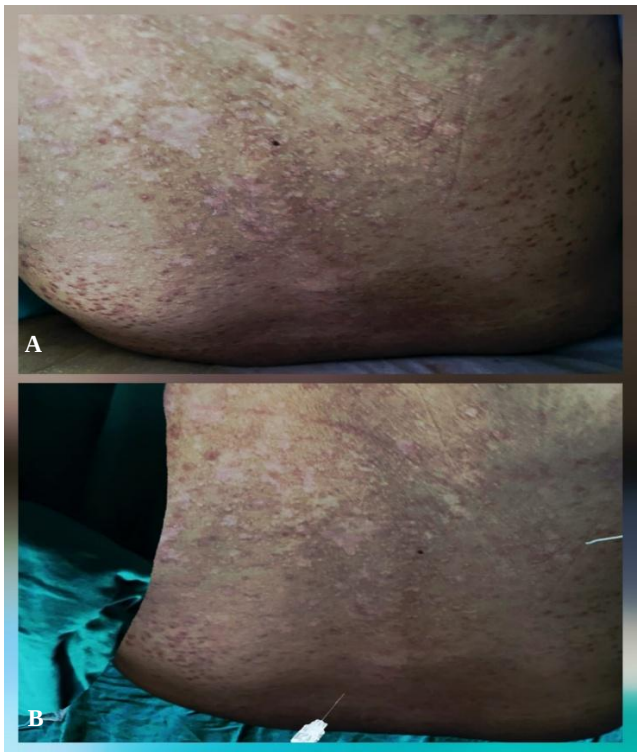


Figure 1 (A and B): Patient with extensive psoriatic plaques over whole back, positioned sitting for neuraxial anaesthesia. A spinal needle is in situ at L5-S1 interspace via taylor's paramedian approach.

A bilaterally symmetrical sensory block up to the T10 dermatome and a motor block of Bromage grade 3 were achieved within six and half minutes of spinal block. The patient remained haemodynamically stable throughout the procedure, without significant hypotension, bradycardia or the need for vasopressor support. Superficial skin grafting over the amputation stump was completed uneventfully over a surgical duration of approximately two hours. The block regressed over the expected duration postoperatively and the patient was observed for two hours without any haemodynamic, neurological or cutaneous complication. On follow-up, the puncture site healed normally with no new psoriatic lesion or Koebner response and the skin graft took well.

DISCUSSION

Psoriasis is a prevalent, chronic, relapsing immune-mediated dermatosis affecting about 1-3% of the people worldwide, caused by dysregulated T-cell activity and a core IL-23/IL-17 inflammatory axis that promote keratinocyte proliferation. In addition to its cutaneous burden, psoriasis has well established systemic associations, such as psoriatic arthritis, metabolic syndrome and cardiovascular disease.[1] The Koebner (isomorphic) phenomenon refers to the formation of new psoriatic lesions at sites of cutaneous trauma such as surgical incisions, burns, insect bites and needle punctures. Even though psoriasis itself is not an infectious condition, but Koebner phenomenon together with the practical difficulty of obtaining reliable skin antisepsis over thickened, scaling plaques, are the reason behind the reluctance to site a spinal or epidural needle through actively diseased skin.

Localized infection at the targeted skin puncture site as an absolute contraindication to neuraxial techniques as per anaesthesia textbooks.[2] Although psoriatic plaques are not infected in the conventional sense but disrupted, fissured or excoriated plaques can have surface colonisation. The combination of a compromised skin barrier with a theoretical risk of creating a new lesion at the puncture site makes the standard lumbar window unappealing when extensive disease is present. In this patient, as the plaques were confluent nearly the entire back, so the standard L3-4/L4-5 interspace could not be reliably reached through unaffected skin.

Taylor's approach provides a practical solution. It was first described by Taylor in 1940 as a lumbosacral subarachnoid tap through the L5-S1 interspace which is the largest interlaminar space in the vertebral column and one that is relatively resistant to degenerative narrowing.[1] Since then it has been reported as a reliable substitute to the conventional midline or paramedian technique in patients with anatomically challenging spines such as severe scoliosis as well as in radiological or ultrasonographic assisted variants when surface landmarks are unreliable, generally with the better success rates once the operator is familiar with the landmarks.[4,6] In more recent it has also been used, as in the instance, to access the subarachnoid space through an region of skin spared by localized pathology like a case in which a lumbar abrasion and hematoma that crossed the midline precluded the standard approach and was instead managed with a modified Taylor's approach on the side that was less affected.[5] A recent retrospective series of patients with challenging lumbar access managed by Taylor's approach reported a mean sensory and motor block onset time of little over eight minutes with a few complication rate, supporting its reliability as a standard alternative procedure.[6]

In this case, Taylor's approach allowed the anaesthesia team to site the spinal needle through skin that was comparatively free of active plaques near the L5-S1 level, thereby able to avoid the theoretical risks of needling through diseased skin. This results in achieving a reliable subarachnoid block adequate for the surgery and sparing the patient from receiving a second general anaesthetic so soon after her index trauma surgery. Additionally, local anaesthetic act on cutaneous sensory neurons as a modulator of psoriatic inflammation, with epidural lidocaine shown to reduce lesion severity in a small clinical series by interfering sensory neuron dendritic cell signalling.[7] While this was not the intent in our patient, it is a reminder that the interaction between neuraxial/regional techniques and psoriasis goes beyond simple avoidance of diseased skin and may be of future research interest. This report is limited by its single-case nature and the precise contribution of Taylor's approach (versus simply choosing a different, less affected region of skin at a conventional level) cannot be determine from one case.

CONCLUSION

Conventional midline or paramedian spinal anaesthesia may not be feasible in active, extensive psoriasis overlying the lumbar spine. Taylor's lumbosacral approach carried out through the L5-S1 interspace, offered a safe and effective alternative while avoiding diseased skin and the risk of a Koebner reaction at the puncture site while achieving reliable neuraxial anaesthesia for lower-limb surgery. Awareness of this technique and of dermatological disease as a relative indication for it, may help anaesthetists to offer regional anaesthesia to patients who would otherwise choose GA.

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