“Dry tap” during spinal anaesthesia turns out to be epidural abscess

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ABSTRACT

We report a case of “dry tap” during spinal anaesthesia in a patient posted for incision and drainage of lower limb with cellulitis. When the patient was being given sub-arachnoid block (SAB) for regional anaesthesia, it turned out to be a case of pyogenic ilio-psoas abscess extended up to the paravertebral and epidural spaces. The causative organism was *Staphylococcus aureus*. This is probably the first case reported when epidural abscess is diagnosed during SAB.

Key words: Dry tap, epidural abscess, spinal anaesthesia, sub-arachnoid block

INTRODUCTION

“Dry tap” during sub-arachnoid block (SAB) is a rare but troublesome incidence. The problem sometimes becomes difficult to solve or what to do next, kind of, due to its rare occurrence and sparse reporting. The annual incidence of spinal epidural abscess is 2.5–3 per 10,000 hospital admissions in the United States.[1] This is probably the first case reported when epidural abscess is diagnosed during SAB. We report a case of pyogenic ilio-psoas abscess extended up to the paravertebral and epidural spaces, diagnosed incidentally after a dry spinal tap. The causative organism was *Staphylococcus aureus*. We share this experience due to its unusual clinical presentation of a “dry tap” during spinal anaesthesia associated with epidural abscess. Reports of the coincident cases of primary psoas (ilio-psoas) abscess with epidural abscess are very few. Primary psoas abscess is also an unusual finding, usually abscess of the psoas muscle resulting from disease of the lumbar vertebrae, with the pus descending into the muscle sheath being common. The most common causative organism in primary psoas abscess is *S. aureus* and, in secondary psoas abscess, is Tuberculous bacteria.[1]

CASE REPORT

A 40-year-old male Trackman by occupation in the Railways was posted for fasciotomy and drainage of right thigh and leg in emergency. His presenting complaint on admission was pain in the right knee since 10 days and swelling in the right lower limb and difficulty in walking since 4 days. He had a history of blunt trauma on right knee by metal trolley at workshop 10 days back. At the same time, he had developed diarrhoea as well, for which he took medicines and was relieved within 2–3 days. He had no history of any chronic medical illness, but was a chronic alcoholic.

On the pre-anaesthetic check-up, the patient had a toxic look, pallor, icterus and pitting oedema. His pulse was 110/min, blood pressure was 110/62 mmHg and respiratory rate was 16/min. Systemic examination was normal. Investigations were: haemoglobin (Hb), 13.2 gm%; white blood cell count (WBC), 11500/mm³; differential counts, within normal limits; fasting blood sugar (FBS), 245 mg%; post-prandial blood sugar (PPBS), 245 mg%; prothrombin time (PT), 13.8 s; international normalised ratio (INR), 1.27; blood urea nitrogen (BUN), 112.7 mg/dL;
creatinine 3.49 mg/dL; total bilirubin, 1.7 mg/dL (direct, 0.9 mg/dL and indirect, 0.8 mg/dL); and SGPT, 69.4 U/L. X-ray hip and knee joint came out to be normal. Doppler study of the lower limb was done to rule out deep vein thrombosis (DVT), which showed a normal vascular study but large abscess on deep fascia from mid thigh to knee, then below knee toward the medial aspect in between the fascia. Ultrasonography (USG) abdomen showed fatty liver, while the remainder was normal. Physician referred the case for deranged renal functions. Intravenous (IV) fluid given to rehydrate the patient and Injection (inj) insulin was started as per the sliding scale. Repeat BUN and creatinine had come down to 105 mg/dL and 2.35 mg/dL, respectively.

The patient was taken to the operation theatre with American Society Anesthesiologist (ASA) Grade III (E) physical status, with informed consent. The patient was given a left lateral position with partial flexion of the right limb for spinal anaesthesia after adequate pre-loading. He was unable to flex the hip joint due to pain. Then, after aseptic preparation, SAB was attempted at the L3-L4 space with a 25G Quincke spinal needle. The subarachnoid space was located easily with give-way feeling, but cerebrospinal fluid (CSF) flow did not come. The stylet was reinserted and removed to clear the lumen of the needle and the needle was then withdrawn gradually. It was further advanced gradually but CSF could not be aspirated. Space was again located and a second attempt was made in the same space. Then, the space changed to L4-L5 and then L2-L3 with a 23G spinal needle, but CSF flow was absent in spite of a good give-way feeling. Finally, in the subarachnoid space at L2-L3 through a 23G spinal needle after confirming with give-way feeling, aspiration of CSF was tried but failed. Then, the needle was angled towards the right lateral recess of the subarachnoid space by mild manipulation and again aspirated, but this attempt was also futile. Then, while considering giving drug in this space even in the absence of CSF to take chance, to great surprise, straw-coloured thick material at the hub of the spinal needle was noticed [Figure 1]. The spinal needle removed and sent for culture and sensitivity of the pus. Surgery was deferred temporarily to evaluate further and the patient was advised urgent magnetic resonance imaging (MRI) of the dorsolumbar spine.

MRI scan on the second day reported that there was a large abscess in the right iliac fossa and gluteal region on either side with epidural extension of the abscess in the lumbar spine from L2 to the sacral segments compressing the thecal sac and traversing nerve roots [Figure 2]. Diffuse reduction in the marrow signal intensity of the spinal vertebrae suggested hypercellularity. The screening whole spine also revealed a large localised abscess in the right supraclavicular region and around the right sternoclavicular joint.

USG abdomen and thigh done on the second subsequent day showed no evidence of psoas abscess bilaterally. Pus for acid fast bacillus stain was negative and HIV I and II- tests were also negative.

On the third day, BUN and Sr creatinine came down to 45.4 mg/dL and 1.22 mg/dL, respectively. FBS was 119 mg/dL, SGOT was 52 U/L, SGPT was 37 U/L and alkaline phosphatase was 128 U/L. Culture and sensitivity (CandS) of pus from the spinal needle and aspiration from the thigh showed growth of gram

![Figure 1: Pus coming out through the spinal needle](image1)

![Figure 2: Magnetic resonance imaging image showing epidural abscess in the right parasagittal section](image2)
positive Staphylococcus with coagulase test positive. On the third day, fasciotomy of the right thigh and leg were done under general anaesthesia. Inj Ticarcillin disodium and clavulanate potassium 3.1 gm iv 8-hourly and inj Metronidazole 100 mg iv 8-hourly was started with inj insulin. On the fifth day, pus CandS after 48 h showed growth of gram positive Staphylococcus with coagulase test positive. Blood C and S was negative.

On the sixth day, MRI of the pelvis showed a multiloculated abscess in the soft tissue musculature of the right iliac fossa, gluteal region bilaterally and the right thigh with diffuse alteration in the marrow signal intensity of the L5 vertebrae and along the right sacro-iliac joint. The finding is suggestive of an infective etiology. The screening of T2W images of the lumbar spine reveals an epidural extension of the abscess with compression of the thecal sac at the L2-L5 level.

He was continued with antibiotics. Gradually, wound at the drainage site healed, pain subsided, he was able to walk and there was no neurological deficit. During this stay, his Hb had gone down to 7.7 gm/dL and he received two units of blood transfusions. The patient remained hospitalised for a total of 40 days. He was discharged with all biochemistry investigations normal.

**DISCUSSION**

As an anaesthesiologist, we can come across a situation of “Dry Tap” during SAB, where no CSF comes out in spite of the needle being in the correct space. Causes of “dry tap” include a blocked needle, needle in the wrong space, post-spinal surgery and low CSF pressures. It is also possible that in patients with “absent” CSF or very low CSF pressure, the subarachnoid space is obliterated as the arachnoid “collapses” on the pia.[2] Ramachandran and Ponnusamy have described successful spinal anaesthesia after multiple attempts with a distinct “give”, but no free flow of CSF[2] Tsui et al. have described an electrical stimulation with insulated needle as a useful and reliable “real-time” technique to confirm intrathecal or subdural placement, even in the absence of CSF flow.[3-5]

Psoas muscle abscess is a rare condition with vague clinical presentation, which presents a diagnostic challenge requiring a high index of suspicion.[6] A psoas (or iliopsoas) abscess is a collection of pus in the iliopsoas muscle compartment.[7] It may arise via contiguous spread from adjacent structures or by the hematogenous route from a distant site. The psoas muscle arises from the transverse processes and the lateral aspects of the vertebral bodies between the twelfth thoracic and the fifth lumbar vertebrae. From this origin, it courses downward across the pelvic brim, passes deep to the inguinal ligament and anterior to the hip joint capsule to form a tendon that inserts into the lesser trochanter of the femur. The iliacus muscle joins the psoas to insert via the same tendon,[6] The fascia that envelops the iliopsoas compartment covers the iliacus, psoas major and psoas minor and courses through the retroperitoneal space from the lower part of the thorax to the lower lumbar vertebrae and defines the iliopsoas compartment.[8]

Primary spinal epidural abscess is also an uncommon finding, the most common risk factor being diabetes mellitus, followed by spinal trauma (may be remote) or surgery, intravenous drug abuse, alcoholism, renal insufficiency, immunocompromised and post-spinal/epidural injections.[1] Secondary spinal epidural abscesses in 10–30% of the cases result from direct extension of local infection, usually vertebral osteomyelitis, psoas abscess or contiguous soft-tissue infection.[9]

In this patient, diabetes mellitus and alcoholism were present as risk factors and also there was a history of trauma. The MRI report showed multiple abscesses including supraclavicular region and around right sacroiliac joint. The patient had no sign of meningitis or central nervous system involvement. It was either primary iliopsoas abscess extending to epidural space or primary epidural abscess extending to iliopsoas compartment.

In conclusion, during anaesthesia, we should keep in mind the possibility of epidural abscess in case of “dry tap” during spinal block in patients with risk factors and in proven case of iliopsoas abscess.

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Conference Calendar Details

Name of the conference: International Congress on Pediatric Airway
Dates: 8th & 9th September, 2012
Venue: Hotel Green Park, Chennai
Organising Secretary: Dr. S Ramesh, Kanchi Kamakoti CHILD’s Trust Hospital, 12 A, Nageswara Road, Chennai – 34, Tamil Nadu, India
E-mail: info@icpa2012.com, paedrsramesh@yahoo.com
Website: www.drsramesh.com

Name of the conference: XXV – BJSAC – 2012, 25th Annual State Conference of Bihar & Jharkhand Chapter
Dates: 22nd & 23rd September, 2012
Venue: RIMS, Ranchi
Organising Secretary: Dr. P K Tiwari, Department of Anaesthesiology & Critical Care, Rajendra Institute of Medical Sciences, Ranchi – 834009, Jharkhand, India
Contact: Mobile: +91 9661883797
E-mail: drpkit80@gamil.com
Website: www.bjsac2012.com

Name of the conference: KISACON – 2012, 26th Karnataka State Conference of Indian Society of Anaesthesiologists
Date: 5th to 7th October, 2012
Venue: T V Ramana Pai Convention Centre, Mangalore
Organising Secretary: Dr. AV Mallikarjun, Surgical Day Care Centre, “Sanjeevini” Falnir Road, Mangalore – 575 002, Karnataka, India
Contact: +91 98450 80462
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Name of the conference: WISACON 2012, 9th West Zone and 45th Gujarat State Chapter of ISA, 2012
Date: 13th & 14th October, 2012
Venue: Institute of Management, Nirma University Campus, S G Highway, Ahmedabad, Gujarat, India
Organising Secretary: Dr. S K Shah, Professor of Anaesthesiology, B J medical College, Ahmedabad, Gujarat, India
Contact: 91-9824369421
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Website: www.wisacon2012.com

Name of the conference: 3rd National Difficult Airway Conference (NDACON 2012)
Date: 26th & 28th October, 2012
Venue: J. N. Medical College, KLE University Campus, and KLES Dr. Prabhakar Kore Hospital & MRC, Belgaum, Karnataka, India
Organising Chairperson: Dr. C S Sanikop
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Name of the conference: RSACPCON – 2012, 22nd National Conference of Research Society of Anaesthesiology and Research Pharmacology
Date: 26th to 28th October, 2012
Venue: B.M. Birla Science and Technology Research Center, Statue Center, Jaipur
Organising Secretary: Dr. S P Sharma, B – 77, Sethi Colony, Jaipur – 302 004, Rajasthan, India
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Name of the conference: ISACON Kerala - 2012, 36th Annual State Conference of ISA Kerala State Chapter
Date: 13th & 14th October, 2012
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