

**ARE GADGETS SAVIOURS IN SALVAGING SICK CASES – ULTRASOUND FOR BOTH NERVE BLOCKS AND VASCULAR ACCESS IN A CASE OF SEPTIC SHOCK**

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**ABSTRACT**

Diabetes mellitus and diabetic foot syndrome presents to us with varying degrees of sepsis. We present a 52-year-old male with chronic diabetes with fore foot sepsis in shock. His blood sugar was controlled with insulin and the other parameters were normal. The blood pressure was around 90/50 mm Hg with noradrenaline support of 0.5 mic/kg/min. We secured a right internal jugular venous access with ultrasound (USG). The volume status as assessed by USG of the IVC was satisfactory. We administered popliteal sciatic nerve block along with saphenous nerve block visualizing the nerves with USG. The amputation of forefoot went on for 1 h where the hemodynamics remained stable at 100/70 mmHg. After the surgery was over, the patient was shifted to sick cubicle and in the next 6 h, the inotrope support was weaned off. The control of sugars was continuously monitored and kept under control. Any other form of neuraxial block could have been detrimental to him in the presence of hemodynamic imbalance. Such precise deposition of local anesthetics in the sciatic nerve is very difficult without the use of USG. We conclude that advanced gadgets may bring back hope in salvaging sick patients.

**Keywords:** Diabetes, Sepsis, Nerve block, Vascular access, Ultrasound.

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**INTRODUCTION**

India is emerging as the diabetic capital of the world with maximum number of reported cases. The global prevalence of diabetic foot ulcer is approximately 6.3% and is higher in males compared to females. Recently a greater number of cases are getting foot infections with ongoing sepsis. These patients, if left uncared in the early phase, may go for frank sepsis with unstable hemodynamics. Debridement and removal of infectious focus form the essential core in the management of such cases [1]. Anesthesia, especially a neuraxial technique, can cause hypotension which may be difficult to stabilize. In such cases, selective nerve blocks will be very useful. However, nerve blocks are being revolutionized by the introduction of USG, using which we can visualize the nerve and give the drugs with precision [2]. In such sick patients, intravenous access is usually a nightmare. The use of USG will also make vascular access very easy. Hence, in this case report, we have tried to establish the use of gadgets like USG in reviving sick patients.

**CASE CAPSULE**

A 56-year-old 70 kg male presented to us with a swelling, mild pain in the right foot for 10 days. There was a history of mild fever. There was no other history suggestive of oliguria or altered consciousness. The pulse rate was around 120–125/min with a blood pressure of 90/60 mmHg. The volume of the pulse was not very satisfactory. The patient was on 0.5 µg/kg/min of noradrenaline infusion through a peripheral line. The urine output was adequate. The patient was afebrile with normal liver and renal function tests, except with a small raised total leukocyte count. His coagulation profile was normal. The right internal jugular vein was cannulated under ultrasound (USG) guidance and the noradrenaline was shifted to the central venous access. The USG of the inferior vena cava suggested normal intravascular volume. He was under adequate antibiotic cover. The anesthetic technique was a combined popliteal sciatic nerve block and a saphenous nerve block under USG guidance with 15 ml and 2 ml of 0.5 % bupivacaine, respectively. The onset of action was within 1 min and satisfactory anesthesia was achieved within 10 min. In the medial side of upper leg, the saphenous vein was identified and two ml of 0.5% bupivacaine was injected to surround the vein (Fig. 1a-d).

The forefoot amputation was done with a minimal debridement of the wound in the skin of the medial malleolus. The procedure lasted for 1 h. There was no complaint and the intraoperative period was uneventful. The patient was shifted to sick cubicle. Noradrenaline infusion was tapered slowly in the next few hours to be withdrawn completely in around 6–7 h. The blood pressure was well maintained and the urine output was around 500 ml in the early post-operative period. The post-operative analgesia lasted for around 10 h. The diabetic control was with short-acting insulin shots. The post-operative period was otherwise uneventful with stable hemodynamics and a flat well controlled glycemic profile.

**DISCUSSION**

Diabetes mellitus with infectious foot syndromes is encountered in day today practice. A few of these patients present to us with frank sepsis. Unless the septic focus is removed, the general condition is likely to deteriorate further with added organ damage. A few of these cases will be in a tricky condition where the decision is to operate or stabilize. In our case, it was relatively unstable, with fluctuating blood pressure on vasopressors. However, he had normal liver and kidney function tests. Kumar *et al.* [3] have described managing such cases with nerve blocks successfully. However, their case was a case of above knee amputation. Ours was a case of forefoot amputation. When there is a drop in blood pressure in cases of sepsis the decision in fluid challenges will be intriguing [4]. Hence, we did a scan of the inferior vena cava to judge the status. Arjun [5] have described a series of cases with combined sciatic and adductor canal block of the saphenous nerve for below knee surgeries. Yet, we used the below knee saphenous target where only 1–2 ml of local anesthetic is enough. A few practitioners prefer combination of local anesthetics in sciatic nerve block to hasten the onset, but only with bupivacaine alone, as in our case, the onset of action was 1 min which is more than satisfactory [6]. Internal jugular vein is one of the common and easily accessible sites of central venous cannulation. Yet, achieving this venous access in the absence of USG may be tricky in patients with shock [7]. Hence, with USG guidance, we did the same with ease and switched inotrope support to the central vein. As our case had a minimal involvement in the medial side of ankle, the nociceptive

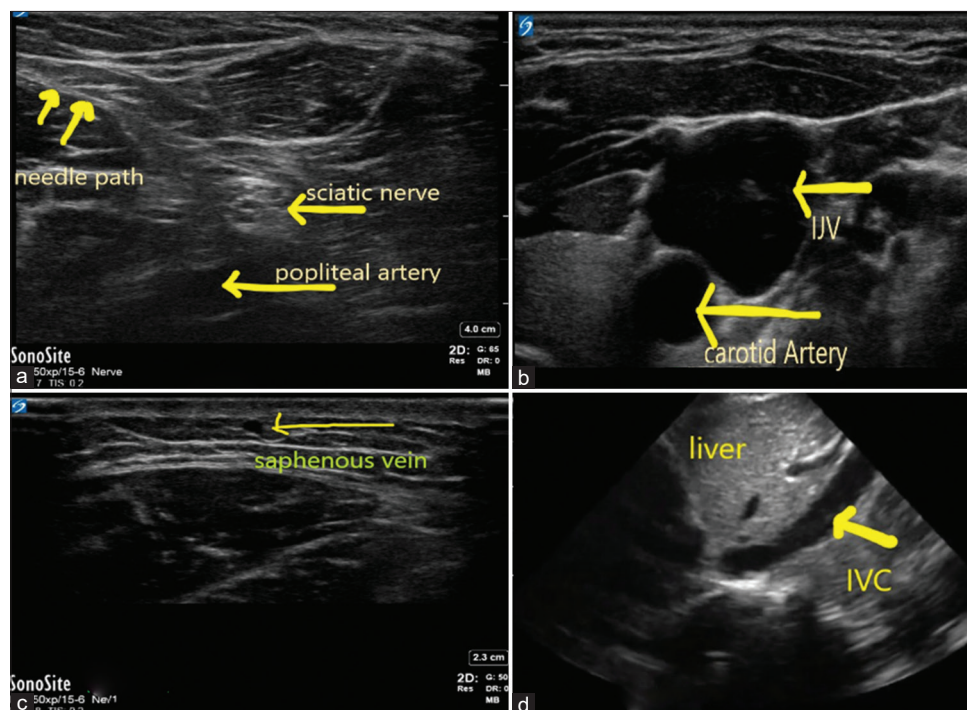


Fig. 1: (a) – Sciatic nerve with needle, (b) saphenous vein, (c) carotid artery and internal jugular vein, (d) inferior vena cava

component is unlikely to fall in the arena of the sciatic nerve alone. Hence, we added the saphenous nerve block. Usually, it is difficult to identify the saphenous nerve, but injection of local anesthetic surrounding the saphenous vein will be the technique for below the blockade. Hence, we identified the saphenous vein to drop the local anesthetic nearby. This was successful in our case. Any form of neuraxial anesthesia [8] is not fool proof as the associated sympathetic blockade will worsen the patient. Peripheral nerve blocks are unlikely to interfere much in hemodynamics. The advantage, we had, in our case was that there was no skin infection at the sites of needle entry points. The main limitation is that we can identify that all the described techniques are established ones. We wanted to emphasize that timely and precise utility of gadgets like USG is likely to benefit the patients with life-threatening diseases.

#### CONCLUSION

The availability of gadgets especially USG machine within the armamentarium of anesthesiologist with multiple utilities such as vascular access, fluid status assessment, identification of specific nerves, and their blockade is definitely going to improve the quality of management of borderline sick cases. The outcomes in such septic cases will be more successful with USG machine in hand.

#### CONFLICT OF INTEREST

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