

Ultrasound guided Axillary Brachial plexus block in a patient with incidental thrombocytopenia: a case report and review of literature

Case Report

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ABSTRACT

Background: Incidental isolated thrombocytopenia is an infrequent finding among pre-surgical patients. The benefits of investigating the mechanism of thrombocytopenia in pre-anaesthetic check-up and clinical management of such a patient is unknown. Further, there are lack of clear guidelines on peripheral nerve blockade in a patient of coagulopathy which creates dilemma among anaesthesiologists in emergency situation where prior optimisation is not possible.

Case presentation: We report a case of machine cut injury of the wrist posted for exploration and repair who was incidentally discovered to have isolated thrombocytopenia. The patient had no history of bleeding tendencies or fever. He was a chronic smoker and tobacco chewer with bilateral wheeze on chest auscultation and decreased mouth opening. General Anaesthesia had considerable risks in view of difficult airway, chances of intraoperative bronchospasm and post-operative pulmonary complications. We opted for ultrasound guided axillary brachial plexus block after considering the risk-benefit ratio and informing the surgeons and patient. Postoperatively, we monitored the patient for 24 hours and ruled out any haematological and neurological complications.

Conclusions: There is paucity of literature on the implications of isolated thrombocytopenia and the safety of peripheral nerve blocks in such patients. This article stresses the need for further large-scale studies to define the lower limit of platelet count and higher limit of INR beyond which peripheral nerve blockade should not be performed.

Key Words: Case report, emergency surgeries, incidental isolated thrombocytopenia, peripheral nerve blockade in coagulopathy.

Received: 22 November 2023, **Accepted:** 09 February 2024

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ISSN: 2090-925X, 2024, Vol.16, No. 2

BACKGROUND

Incidental thrombocytopenia defined as platelet count < 100000/ul is a rare preoperative finding in patients posted for surgery. Peripheral nerve blocks (PNB) in patients of incidental thrombocytopenia is not much reported in literature and the guidelines available do not provide a satisfactory conclusion^[1]. We report a patient of machine cut injury to the wrist who was posted for exploration and repair and was discovered to have incidental thrombocytopenia.

CASE PRESENTATION

A 40 year old male patient with a BMI of 24 kg/m² presented to the emergency with accidental machine cut injury to the wrist. He had suspected radial artery and flexor tendon injury and was posted for exploration and repair. The patient was a smoker since last 20 years, smoking 1 pack of cigarettes a day and a tobacco chewer since last 10 years. He had last smoked 3 hours before the injury. He had no other co-morbidities and his effort tolerance was good. On chest examination, bilateral wheeze was

present. Airway examination revealed tobacco stained teeth and mouth opening of 1.5 cms. His pre-operative vitals were heart rate of 110 beats/min, Blood pressure of 130/80 mm hg and oxygen saturation of 97 % in room air with no evidence of respiratory distress. Blood investigations revealed thrombocytopenia with platelet count of 68,000/ul, INR of 1.05 with other parameters being normal. On enquiry, there were no history of medication use, bleeding tendencies or recent fever episodes. We asked the surgeon to transfuse 6 units of random donor platelets and repeat blood count. Despite transfusion, his platelet count was 78,000/ul. Additional investigations to search for etiology of thrombocytopenia could not be performed due to emergent nature of surgery. We were faced with a decision between general anaesthesia and upper limb nerve block. Our assessment revealed that general anaesthesia (GA) should be avoided due to decreased mouth opening and chances of bronchospasm and post-operative pulmonary complications. We opted for ultrasound (US) guided axillary brachial plexus with musculocutaneous nerve block as we believed that since the site is readily compressible and vascular puncture is of minor consequence, the benefits outweighed the risks. We

informed the patient of concerns of bleeding, hematoma formation, nerve injuries. The patient was sedated with 1 mg of IV Midazolam prior to the procedure and supplemental oxygen was provided via nasal prongs at 4l/min. In-plane method was used and under real-time visibility of needle by ultrasound 10 ml Lignocaine 2 % with 10ml Bupivacaine 0.5 % and 4 mg Dexamethasone was injected and spread was ensured^[2]. There was no evidence of vessel puncture during procedure. Adequate block was achieved in 20 mins which was confirmed by assessing touch, pressure, pinprick sensation and motor movements . The surgery proceeded uneventfully for 6 hours. Tourniquet was used throughout the surgery and was released at 90-minute intervals for 10 minutes. There was no evidence of bruise at the tourniquet site. Blood loss was 500ml. Post-operatively his sensory and motor functions recovered in 10 hours. He was closely monitored for 48 hours and any hematoma or neurological deficits were ruled out. Haematological consultation was done post-operatively. They asked for HIV and HCV testing, peripheral blood smear and complete blood count after 2 weeks and the patient was asked to follow up in OPD.

DISCUSSION

Incidental isolated thrombocytopenia is an uncommon finding in surgical patients. Adverse clinical outcomes are more reported in cases of non-incident rather than incidental thrombocytopenia. It is unknown whether further investigations to search for causes of thrombocytopenia will influence clinical decision making and intraoperative management^[1]. Further, adequate evidence of safety of peripheral nerve block in a patient with isolated thrombocytopenia is lacking . There is no defined lower limit at which peripheral nerve block can be successfully performed. The Association of Anesthetists 2015 guidelines state that any coagulopathy is only a relative contraindication to a regional technique and risk benefit ratio must be discussed with the patient and surgeons and documented. There are paucity of data on the frequency and consequences of haemorrhagic complications after PNB. 32 case reports of serious haemorrhagic complications after plexus or PNB was reported by the American Society of Regional Anesthesia and Pain Medicine of which 18 patients received anti-thrombotics and 14 patients were not anticoagulated. They reported that bleeding complications were more frequent than neurological complications, complete recovery of any neurological deficits occurred in 12 hours, no evidence of vessel trauma in any case and deep plexus or deep peripheral blocks were at most risk. Hence, they came to the conclusion that perineuraxial and deep peripheral nerve blocks should be treated as central neuraxial block and peripheral nerve blocks be performed depending on the vascularity, compressibility of anatomical site and consequences of bleeding at that site^[3].

Canadian Anesthesiologists society classifies axillary block as low risk for bleeding complications but exercises caution to avoid vessel puncture in this vascular rich area. Hematoma formation has been noted in several studies and case reports using nerve stimulator or landmark guided approaches to axillary block but only minor hematoma has been documented using ultrasound technique. Overall, anaesthetists must weigh the risks of GA vs PNB in elective and emergency cases. However, the recommendations of this practice are weak as high quality evidence is lacking^[4].

An article on the use of regional anaesthesia in patients with coagulopathy describes 26 published reports of significant haemorrhagic complications of peripheral nerve and plexus block. Half of these patients were on anticoagulant drugs and the other half had normal coagulation. Patient harm was described as spinal hematoma during attempted paravertebral blocks, exsanguination from injured vessel and compression of airway, major vessels or tissue ischemia due to hematoma^[5].

Majority of these cases underwent deep or superficial perivascular blocks. The article concluded that catheter insertion was more risky than single shot blocks, US guided regional anaesthesia decreases risk of vascular puncture and that an experienced anaesthetist should perform the procedure as fewer attempts to block success decreases risk of complications^[5].

The European Society of Regional Anaesthesia classifies peripheral nerve blocks based on risks of bleeding. However, it claims that it is not definite and individual block categorisation may vary depending on experience and skills. Individual risk-benefit analysis must be made before any block. The lowest bleeding risk technique should be chosen and performed using US guidance^[6].

An article by R.Barker *et al.*, in the BJA provides recommendations on upper limb regional anaesthesia in coagulopathies. It recommends using ultrasound guidance, INR cut-off below 2.5 and platelet above 50,000 for practice across country. It also raises question on absence of robust evidence and the need for studies to discover the true safe limits^[7].

CONCLUSION

There are a number of questions that remain unanswered. What is the prevalence of incidental thrombocytopenia in emergency surgeries? Do further tests to discover the cause change management and improve safety? What are the consequences of isolated thrombocytopenia? What is the cut-off limit for INR and platelet count below which any peripheral nerve block is absolutely contraindicated?

Further trials and studies need to be undertaken to address such aspects and provide a firm guideline based on evidence in current literature.

LIST OF ABBREVIATIONS

- **PNB:** Peripheral nerve block.
- **GA:** General anaesthesia.
- **US:** Ultrasound.
- **BMI:** Body mass index.
- **INR:** International normalised ratio.
- **IV:** Intravenous.
- **HIV:** Human Immunodeficiency virus.
- **HCV:** Hepatitis C virus.
- **OPD:** Out-patient Department.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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