

Ultrasound-Guided External Oblique Fascial Plane Block for Laparotomy Resection of Hepatoblastoma in Pediatric

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ABSTRACT

Background: external oblique interfascial plane block represents new technique to control pain, this technique was used in many studies for adults, we will use this technique on pediatric patient underwent upper abdominal surgery.

Case Presentation: Male patient aged 2y and 7 months, weight 14 kg came to Ibn Sina Hospital operating room on 12 Feb. 2025 for resection of hepatoblastoma mass 7.4*11.2*14.5 cm in segment four of right hepatic lobe, he received chemotherapy, the last session was on 13 Jan. 2025, he was anesthetized generally and then given ultrasound guided external oblique fascial plane block. the child was hemodynamically stable as there was no signs of stimulation like hypertension or tachycardia and also there was no hypotension or bradycardia all over the time of operation, after extubation and also in the recovery room. FLACC scale measured every 5 minutes in the recovery room till discharge and the range was between 0 to 2. Total doses of fentanyl used intraoperatively three doses on 0.5mic/kg (7 mic) over 8 hours of operation. First dose of rescue analgesia was given within the first 24 hours, 1 h and half after operation in the form of pethidine 0.5mg/kg (7mg).

Conclusion: external oblique fascial plane block is effective for pediatric patients undergo upper abdominal surgeries, with good analgesic effect as reduce the doses of opioid used perioperatively, and show applicability without complication.

Keywords: External Volume Fascial Plane Block; Pediatric; Hepatoblastoma

Abbreviations: EOM: External Oblique Muscle; ICU: Intensive Care Unit; ECG: Electrocardiogram; Hb: Hemoglobin; INR: International Normalized Ratio; FLACC scale: (Face, Legs, Activity, Cry, Consolability); APTT: Activated Partial Thromboplastin Time; ALT: Alanine Aminotransferase; AST: Aspartate Transaminase

Background

Upper abdominal surgeries with subcostal incisions are a cause of severe pain and can lead to significant respiratory impairment. External Oblique Interfacial Plane Block is a promising technique used for midline and lateral upper abdominal wall incisions, LA is deposited into the fascial plane beneath the external oblique muscle (EOM) and superficial to the sixth rib or external intercostal targets anterior and lateral cutaneous branches of the thoracoabdominal nerves from the ventral rami of spinal nerves [1] The plane deep into EOM may

continue downwards with the transversus abdominis plane. Clinical investigations have consistently demonstrated the engagement of T6-T10 dermatomes at the anterior axillary line and T6-T9 at the midline following External oblique interfascial plane block [2] The FLACC scale (Face, Legs, Activity, Cry, Consolability) is a pain assessment tool designed for infants and young children. It uses five criteria to rate the severity of pain in children from 0-10: Face, Legs, Activity, Cry, and Consolability. Assessment of Behavioural Score: 0 = Relaxed and comfortable, 1-3 = Mild discomfort, 4-6 = Moderate pain, 7-10 = Severe discomfort/pain [3].

Case Presentation

male patient suffered from Hepatoblastoma aged 2y and 7 months, weight 14 kg came to Ibn Sina Hospital on 12 Feb. 2025 for resection of hepatoblastoma mass 7.4*11.2*14.5 cm in segment four of right hepatic lobe, he received chemotherapy, the last session was on 13 Jan. 2025

On examination:

- **CNS manifestation:** conscious, active, normal motor and sensory function.
- **Cardiac examinations:** normal sinus rhythm, heart rate 130 beat/min and blood pressure 102/65 mmHg.
- **Respiratory:** tachypnea 34 cycle/min with respiratory distress and O₂ saturation on room air was 97%.
- **Airway:** no abnormality.
- **Limbs:** no abnormality.
- **Abdomen:** mass felt in right hypochondrium.
- **His investigation:** Hb: 12.2 gm/dl, platelet 219000 mcl, total leucocytic count 10400 /mm3, INR :0.89, APPT 44 sec, create 511micromoles/L, urea 6.2 mmol/l, Na 141 mEq/L, k 4.8 mEq/L, and albumin 30 gm/l, ALT 47 U/L, AST 52 U/L.
- **Chest x-ray:** port Cath on right side.
- **Echo:** trivial tricuspid regurge and ejection fraction 66%.
- **Ultrasound:** right kidney showed hydronephrosis, splenomegaly with tumor thrombus in portal vein with significant portal hypertension and large mass 7.4*11.2*14.5 cm in segment 4 in right lobe of liver.

The anesthesia team recommend for preparation of fresh frozen plasm, packed RBCs, platelet and cryoprecipitate, and arranged for pediatric ICU place, explain to parents the risk and how we would manage, reassured them and written consent obtained, and consent taken from them. In the operating room we monitored non-invasive blood pressure and invasive blood pressure monitoring via left radial artery catheter size 24, pulse oximeter for O₂ saturation, temperature, capnography and 5 leads ECG, the anesthesia was done by using fentanyl 20 mic, propofol 30 mg, ketamine 5 mg, nimbex 3 mg and paracetamol 15mg/kg (210 mg). endotracheal tube size 4 cuffed inserted by C-Mac (KARL STORZ- ENDOSKOPE) using 4.5 cuffed regular tube. Central line size 5 was inserted in the left external jugular.

The patient was placed in the supine position with a slightly abducted ipsilateral arm. The sixth rib was located by the craniocaudal technique, the second rib was identified just below the clavicle, and

subsequent counting facilitates localization of the sixth rib. We used superficial probe of LOGIO e ultrasound for visualization, under aseptic conditions, using betadine 10%, a nerve block needle Stimuplex Ultra360 (22-gauge x1 3/8, 0.7x35 mm, B|BRAUN) inserted and advanced perpendicular to the skin till contacted the periosteum of the sixth rib, the needle tip was slightly withdrawn 1-2 mm to avoid subperiosteal injection. At this point, the needle tip lied between EOM and the sixth rib. After confirming negative aspiration for blood or air, LA was injected in 0.5 ml/kg total volume (7 ml) of 0.25% bupivacaine.

Result

He was hemodynamically stable allover 8 hours of operation with no drop in blood pressure as it was kept between 90/50 to 110/70 mm/hg allover operation and heart rate was kept between 120 to 140 beat /min.

Total doses of fentanyl used intraoperatively three doses on 0.5mic/kg (7 mic) over 8 hours of operation.The patient was extubated and shifted to PACU, according to FLACC scale measured every 5 minutes for30 minutesby anesthetist who was blind for the technique it was between 0-2. First dose of rescue analgesia was only one dose received one and half hours after operation throught the first 24 hours in the form of pethidine 0.5mg/kg (7mg).

Table 1: First dose of rescue analgesia was only one dose received one and half hours after operation throught the first 24 hours in the form of pethidine 0.5mg/kg (7mg).

	5 min.	10 min.	15 min.	20 min.	25 min.	30 min.
FLACC score	0	0	0	1	1	2

Discussion

There were case series done by Shruti Shrey, et al. [4] who describe case series of five patients who underwent upper abdominal surgeries with subcostal incision and found that technique would reduce perioperative opioid requirement and enhance early mobilization and recovery. The difference in our case is that we use bupivacaine, only one case in major operation while the study did not determine the age neither the operation types. Many studies used this technique on adult patients but there is very little studies done on pediatric patients.

Conclusion

external oblique fascial plane block is effective for pediatric patients undergo upper abdominal surgeries, with good analgesic effect as reduce the doses of opioid used perioperatively, and show applicability without complication.

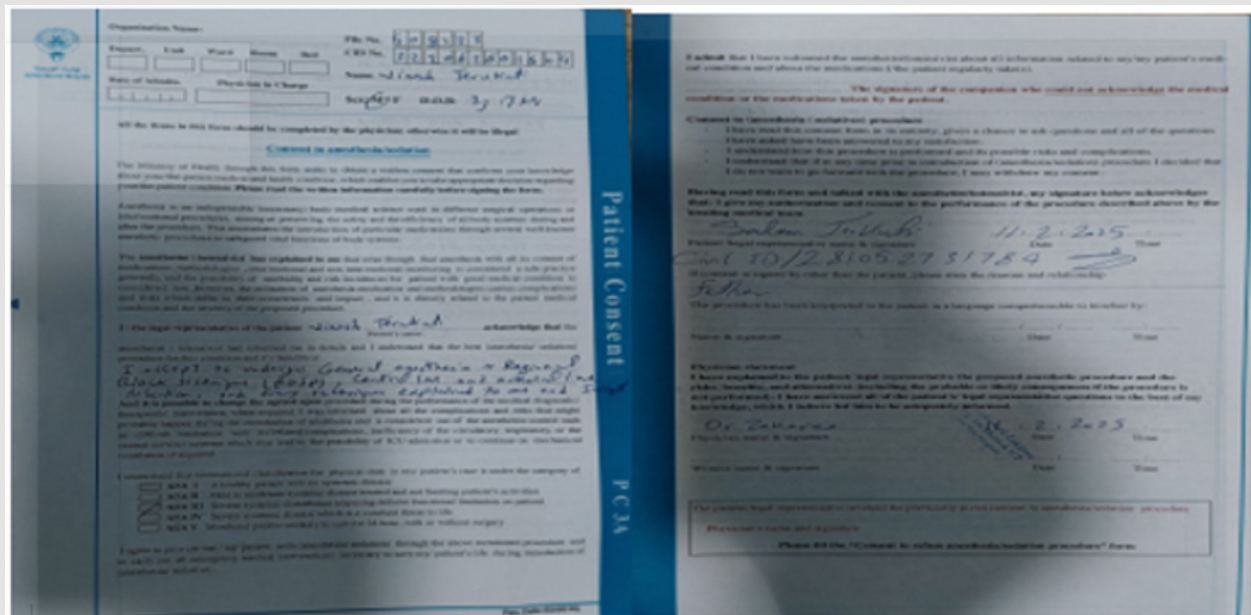


Figure 1.

Declaration

Ethics approval and consent to participate:

Competing Interests

The authors declare that they have no competing interest.

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Authors' Contributions:

Mohamed Zakarea Wfa: analyse and interpreted the patient data.
Khaled Ahmed Soliman: review the data with us

References

1. Hamilton DL, Manickam BP, Wilson MAJ, Abdel Meguid E (2019) External oblique fascial plane block. *Regional Anesthesia and Pain Medicine* 44: 528-529.
2. Mistry T, Sharma SK, Sonawane KB (2024) External oblique intercostal plane block: Anatomical landmark-guided technique! *Indian Journal of Anesthesia* 68(5): 504-505.
3. Chan AY, Ge M, Harrop E, Johnson M, Oulton K, et al. (2021) Pain assessment tools in paediatric palliative care: A systematic review of psychometric properties and recommendations for clinical practice. *Palliative Medicine* 36(1): 30-43.
4. Shrey S, Sinha C, Kumar A (2023) OP033 Analgesic efficacy of external oblique intercostal plane block in pediatric patients undergoing upper abdominal surgeries: a case series *Regional Anesthesia & Pain Medicine* 48: A19-A20.

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