Dexmedetomidine Indications

- Update on scalp nerve block for craniotomy
- Association of Early Dexmedetomidine Utilization With Clinical and Functional Outcomes Following Moderate-Severe Traumatic Brain Injury: A Transforming Clinical Research and Knowledge in Traumatic Brain Injury Study
- Anesthesia for same day neurosurgery with updates on awake craniotomy and awake spine surgery
- Awake craniotomies in the pediatric population: a systematic review
- Prolonged Infusion of Dexmedetomidine in Critically-ill Children
- Patients selection for awake neurosurgery
- Awake craniotomy. Considerations in special situations

Goals of anesthesia in neurosurgery include stable cerebral hemodynamics and provide relaxed brain to surgeon. Dexmedetomidine and lignocaine as an adjuvant can fulfill these criteria but literature comparing the two are sparse. Dexmedetomidine as an adjuvant to anesthetic drugs has a better profile than lignocaine in suppressing stress response and preventing hemodynamic variations at intubation, skull pin application, and surgical incision. Dexmedetomidine increases the duration of effective analgesia more than lignocaine, in postoperative period in patients undergoing craniotomy [1].

Dexmedetomidine (Precedex®). Alpha 2 adrenergic receptor agonist, used for control of hypertension postoperatively, as well as for its sedating qualities during awake craniotomy either alone or in conjunction with propofol. Also used to help patients tolerate endotracheal tube without sedatives/narcotics to facilitate extubation.

Chronic subdural hematoma

Dexmedetomidine-based sedation compared to propofol, along with scalp block for monitored anaesthesia care (MAC) in patients undergoing burr hole evacuation of CSDH is associated with haemodynamic stability and greater surgeon satisfaction [2].

Awake craniotomy

Dexmedetomidine for awake craniotomy.

Sedation

Dexmedetomidine is safer and equally effective agent compared to propofol and midazolam for sedation of neurosurgical mechanically ventilated patients with good hemodynamic stability and extubation time as rapid as propofol. Dexmedetomidine also reduced postoperative fentanyl requirements [3].

DEX sedation for interventional pain management during procedures such as gasserian ganglion block may be useful [4].

Postoperative pain control

Intraoperative dexmedetomidine infusion was effective for reducing pain and analgesic consumption after craniotomy. In addition, dexmedetomidine may help to reduce postoperative nausea and vomiting (PONV) in patients after craniotomy treated with tramadol postoperatively. Chinese Clinical Trial Register identifier: ChiCTR-TRC-13003598 [5].

Intravenous DEX exhibits synergism with regional anesthesia and facilitates postoperative pain control [6] [7].

Monitored anesthesia care using dexmedetomidine without loading dose for embolization of intracranial aneurysms appeared to be a safe and effective alternative to general anesthesia [8].

Dexmedetomidine is useful during intraoperative electrocorticography (ECoG) recording in epilepsy surgery as it enhances or does not alter spike rate in most of the cases, without any major adverse effects.

Dexmedetomidine is a option for treatment of acute severe baclofen withdrawal [9].

Microelectrode recordings in pediatric DBS can be preserved with a combination of dexmedetomidine and ketamine, remifentanil, and nicardipine. This preservation of MERs is particularly crucial in electrode placement in children [10].

1)
Shekhar S, Goyal N, Mirza AA, Agrawal S. Evaluation of effects of intravenous infusion of dexmedetomidine or lignocaine on stress response and postoperative pain in patients undergoing craniotomy for intracranial tumors: A randomized controlled exploratory study. Saudi J Anaesth. 2024 Jul-Sep;18(3):402-409. doi: 10.4103/sja.sja_141_24. Epub 2024 Jun 4. PMID: 39149745; PMCID: PMC11323921.
2)
Srivastava VK, Agrawal S, Kumar S, Khan S, Sharma S, Kumar R. Comparative Evaluation of Dexmedetomidine and Propofol Along With Scalp Block on Haemodynamic and Postoperative Recovery for Chronic Subdural Haematoma Evacuation Under Monitored Anaesthesia Care. Turk J Anaesthesiol Reanim. 2018 Feb;46(1):51-56. doi: 10.5152/TJAR.2018.16878. Epub 2018 Feb 1. PubMed PMID: 30140501; PubMed Central PMCID: PMC5858890.
3)
Srivastava VK, Agrawal S, Kumar S, Mishra A, Sharma S, Kumar R. Comparison of dexmedetomidine, propofol and midazolam for short-term sedation in postoperatively mechanically ventilated neurosurgical patients. J Clin Diagn Res. 2014 Sep;8(9):GC04-7. doi: 10.7860/JCDR/2014/8797.4817. Epub 2014 Sep 20. PubMed PMID: 25386451; PubMed Central PMCID: PMC4225903.
4)
Kido H, Komasawa N, Fujiwara S, Hyoda A, Morimoto K, Minami T. [Gasserian ganglion block for trigeminal neuralgia under dexmedetomidine sedation]. Masui. 2014 Aug;63(8):901-3. Japanese. PubMed PMID: 25199328.
5)
Peng K, Jin XH, Liu SL, Ji FH. Effect of Intraoperative Dexmedetomidine on Post-Craniotomy Pain. Clin Ther. 2015 Mar 10. pii: S0149-2918(15)00077-6. doi: 10.1016/j.clinthera.2015.02.011. [Epub ahead of print] PubMed PMID: 25769614.

6)
Adams R, Brown GT, Davidson M, Fisher E, Mathisen J, et al. (2013) Efficacy of dexmedetomidine compared with midazolam for sedation in adult intensive care patients: a systematic review. British journal of anaesthesia 111: 703–710
7)
Abdallah FW, Abrishami A, Brull R (2013) The facilitatory effects of intravenous dexmedetomidine on the duration of spinal anesthesia: a systematic review and meta-analysis. Anesthesia and analgesia 117: 271–278
8)
Lee HH, Jung YJ, Choi BY, Chang CH. Usefulness of Dexmedetomidine during Intracerebral Aneurysm Coiling. J Korean Neurosurg Soc. 2014 Apr;55(4):185-9. doi: 10.3340/jkns.2014.55.4.185. Epub 2014 Apr 30. PubMed PMID: 25024820; PubMed Central PMCID: PMC4094741.
9)
Morr S, Heard CM, Li V, Reynolds RM. Dexmedetomidine for Acute Baclofen Withdrawal. Neurocrit Care. 2014 Nov 18. [Epub ahead of print] PubMed PMID: 25403764.
10)
Hippard HK, Watcha M, Stocco AJ, Curry D. Preservation of microelectrode recordings with non-GABAergic drugs during deep brain stimulator placement in children. J Neurosurg Pediatr. 2014 Sep;14(3):279-86. doi: 10.3171/2014.5.PEDS13103. Epub 2014 Jul 4. PubMed PMID: 24995822.