

Case Report

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Acute sub dural hematoma with extra dural hematoma evacuation in ventricular septal defect patient using conventional craniotomy under local anesthesia following peer regimen.

Peer Asad Aziz^{1}, Riaz Ahmed Raja¹, Ali Gohar Kalhoro¹, Sanaullah Pathan¹, Muzaffar Bhand¹ & Syed Zeeshan Shah¹*

¹Department of Neurosurgery, Liaquat University of Medical Health Sciences

*Corresponding Author Email ID: pirasadaziz@hotmail.com

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Abstract

Background: Extradural hematoma (EDH), and acute subdural hematoma (ASDH) are common pathologies encountered in neurosurgical emergencies following traumatic injuries usually secondary to road traffic accident, assault and fall. Both extradural hematoma and acute subdural hematoma have dreadful effects on patient's health if not managed properly and timely and even lead to death. The standard treatment for such problems is conventional large craniotomy under general anesthesia to prevent fatal outcomes.

Method: We have presented a case of ASDH with EDH in a patient having history of large ventricular septal defect and due to large ventricular septal defect patient had delay in getting fitness and alongside patient had fallen Glasgow Coma Scale (GCS) which encouraged surgeon to perform the surgery under local anesthesia by following Peer Regimen.

Results: The outcome of case turned fruitful and providing possibility of Local anesthesia (Peer Regimen) as an alternate in case of critical emergency to save life of patient.

Conclusion: Acute Subdural hematoma with either concomitant ventricular septal defect or alone can be evacuated safely under local anesthesia using Peer regimen. Further studies should be carried to know the more benefits of procedure and potential hazards of procedure and to improve outcome from this lethal type of brain injury.

Keywords

Subdural Hematoma, Extradural Hematoma, Local Anesthesia, Peer Regimen, Craniotomy

Introduction

According to the World Health Organization, by the year 2020, the outcomes of many diseases as major cause of death and disability will be due to Traumatic brain injury (TBI)¹. As estimated that 10 million people are affected annually by TBI, the problem of mortality and morbidity that this ailment inflicts on society, makes TBI a determined public health and medical problem. The problem of TBI is apparent throughout the world, and is specifically prominent in low and middle

income countries where the majority of risk factors for causes of TBI are ineffectively equipped to address the concomitant health outcomes. However the rate of road traffic injuries are nearly 60% throughout the world; whereas 20-30% injuries are due to falls; 10% of injuries are due to violence and the same 10% of injuries are due to the combination of work place and sports².

The injury acquired by TBI can be differentiated into primary and secondary mechanisms. Primary injury is typically

defined as the direct mechanical damage caused by trauma. These injuries are usually apparent acutely and contain fractures, intracranial hemorrhage (extradural hematoma, subdural hematoma), contusion and traumatic axonal injury. CT scan and MRI are usually used to detect this type of injuries^{3,4}.

Majority of these mortalities among United States and rest of world in persons with age range 1 - 45 years are due to the road accidents⁵, which may either cause concussion or severe brain injury, majority of them suffer severe head injuries secondary to motor vehicle accidents. Among these injuries majority suffer from extradural hematoma and subdural hematomas. These intracranial hematoma carry significant mortality rate especially ASDH which had reported mortality of 60-90% of individuals⁵.

Traumatic ASDH is a major clinical entity in TBI. It acts as a space occupying lesion to increase intracranial pressure, and is often complicated by co-existing lesions, and is modified by cerebral blood flow (CBF) changes, coagulopathy, and delayed hematomas. Because of its complicated pathophysiology, the mortality of ASDH is still remaining high⁶. ASDH is one of most lethal type of head injury⁷. Abundant clinical classification systems for TBI centered on symptomology and severity are used, the most rooted clinical estimation is the GCS. GCS score at admission seems to be crucial in the decision-making process. Deteriorating patients with a GCS score between 9 and 11 and with ASDH are those who would benefit most from the surgical treatment⁸.

Hematoma evacuation by large craniotomy is the standard treatment for ASDH with

brainstem compression under general anaesthesia^{9, 10} or decompressive craniotomy may also be carried out, if needed, to prevent secondary brain damage¹¹. Many cases are reported regarding treatment of ASDH through single burr hole craniectomy and drainage¹², mini craniotomy⁸ and endoscopic removal under local anesthesia¹⁰, but none method is effective and standardized till date.

This case study has focused on the basis of local anesthesia in the management of the surgical evacuation of Intracranial Hematoma in which the patient with ASDH concomitantly with EDH in large ventricular septal defect patient was operated under local anesthesia.

To our best of knowledge till date no previous case has been reported regarding evacuation of ASDH concomitantly with EDH in large ventricular septal defect patient through conventional craniotomy under local anesthesia. This case embraces a significant character as craniotomy for subdural and extradural hematoma is a common procedure under general anesthesia is common practice but for subdural hematoma associated with ventricular septal defect, craniotomy is not yet reported under local anesthesia.

Case Report:

30year old male presented to accident and emergency department Liaquat university hospital, Hyderabad from Samaro. Patient had known history of large ventricular septal defect and had assault head injury as alleged with axe and had lacerated wound over left frontal region. On presentation to emergency department patient had GCS of 14/15 with blood pressure of 100/60 mmHg, pulse 104/min, afebrile with cold peripheries, he had right sided papillary dilation which was

slightly reactive to light, while left sided pupil was constricted. Patient was planned for urgent CT scan which was performed within 30 mins of presentation. The CT scan findings were patient had right frontal biconvex and concave hyper density suggesting extra and sub dural hematoma with fracture of frontal bone and with midline shifting 6mm, But within 20 mins of performing CT scan, patient became restless and became severely drowsy. Patient was planned for urgent surgical evacuation of intracranial hematomas but patient was unfit for general anesthesia as advised by on call cardiologist, but as patient had GCS 10/15. So patient was planned for emergent surgery and taking to O.R without further delay after taking high risk consent from brother of patient to carry conventional craniotomy for evacuation of extradural and subdural hematoma under local anesthesia, surgery was proceeded and completed in next 2 hours under local anesthesia using Peer Regimen for craniotomy which included { the patient had been provided with 2% Xylocaine (lidocaine) plus Adrenaline which was applied to the cutaneous and subcutaneous tissues, respectively. In addition to that, injection of Nalbuphine, 1 ampoule (10 mg), mixed with 1 liter of normal saline was continuously administered to the patient during the whole procedure while, intravenous administration of 1gm Provas (Paracetmol) has also been carried on the opposite sides. The muscular layer had been cauterized after which the periosteum has been retracted and four burr hole conventional craniotomy has been made to aid the evacuation of extradural hematoma. The wound has been sealed in layers by applying the tack up sutures before opening of dura 2 mg Midazolam (2-5 mg was given), which facilitated and dura was incised without any resistance in pain free environment underlying subdural hematoma

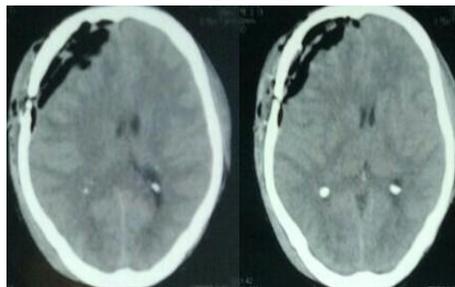
was removed. Complete evacuation of extra and sub dural hematoma was achieved dura repaired primarily. Intraoperative patient had angry looking reddish brain and bleeder underlying dura which was then coagulated using bipolar dura was closed and placing the bone flap back and closing rest of wound in layers. After 8 hours of surgery patient retained GCS of 14/15. Patient had smooth recovery post operatively except he had vertigo which was managed conservatively.

Results

Figure 1: Preoperative Images of CT scan



Figure 2: Postoperative Images of CT scan



Discussion

To add on knowledge this is first case to report regarding evacuation of subdural hematoma with extradural hematoma in a ventricular septal defect heart disease patient under local anesthesia due to the falling of GCS. This was the first case of TBI with the patient history of ventricular septal defect due to which subdural and extradural hematoma underwent large conventional craniotomy under Local anesthesia as

patient's ill history, and the deteriorating GCS 10/15 after 20 minutes of imaging. Hence due to fitness issues to procedure under general anesthesia, procedure was carried and became successful intracranial hematomas were removed under the Local Anesthesia.

Future directions

Acute Subdural hematoma and extradural hematoma can be proceeded under local anesthesia safely under extreme conditions when there contraindications to general anesthesia, or in high risk patients. Case selection should be done wisely for procedure. However we recommend to carry procedure in middle aged and avoid extremes of ages. And intraoperative if patient feels pain one can stop surgery for a while and wait so that patient gets relaxed and thereby avoiding complications like vasovagal shock. Nalbuphine should be administered judiciously with care and should not be given 3-6 hr before surgery. Further studies should be carried to evaluate safety of procedure, deciding better option and to prevent unwanted side effects of general anesthesia¹³.

Conclusion

ASDH can be fatal and together with EDH, carries more lethal outcomes if not managed promptly. Mostly the diseases found as the majority cause of death and disability are usually due to the TBI. This case study suggested that the clinical practice of local anesthesia is more potent, effective and safe than general anesthesia in the patients already diagnosed with the history of severe ventricular septal defect, deteriorating GCS scores and patients who are unfit for general anesthesia. Therefore it has been suggested that Craniotomy of ASDH and EDH can be successfully carried with the local anesthesia following Peer Regimen, as in

case of critical emergency situations in order to save life.

Conflicts of Interests

None.

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