Intraoperative Implication of Image Intensifier in Cranial Surgery

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Introduction

Use of Intraoperative imaging is indispensable in any surgery, however associated higher cost is a limiting factor. There are many modalities available such as MRI, CT scan and O arm but utility of any of these is restricted by large infrastructure cost and technical expertise. One inexpensive modality widely available is Carm. Though the use of C arm is quite limited in cranial surgery, but its use is sometimes becomes of immense importance in traumatic brain injury surgery especially in deep seated depressed fracture. This article is about practical implication of Carm in localizing a fracture segment in frontal depressed fracture intraoperatively.

Case

One gentleman of 35 years old came to emergency department with history of road traffic accident about five hours back. The mechanism involved was described as head struck to sharp metallic part of the vehicle from right frontal side creating a large linear lacerated wound over right frontal region starting from supraorbital ridge to hairline.

On examination Patient was vitally stable with GCS 15/15.

There was a linear lacerated sutured wound present over right frontal region extending vertically from upper margin of right eyebrow to hair line. On imaging there was a large depressed fracture in right frontal region with three segments embedded deep inside the brain parenchyma.

Patient was subjected to emergency craniotomy with extraction of depressed segment. Intraoperatively two of the segments were easily accessible and removed but the last but not the least third segment was not visible. As the brain parenchyma was present all around in the vicinity of anterior cerebral artery exploring blindly can be devastating, so the author used C arm Figure-1-2.

Figure 1&2: On examination Patient was vitally stable with GCS 15/15.
On anterior and lateral projection of skull image made evident the exact location of the last segment. This was confirmed with a metallic instrument in real time using fluoroscopy. This small exercise made possible the complete removal of all the depressed segments. Post-operative non contrast Computed scan confirmed complete removal of fracture segment. Patient improved well postoperatively and was discharged in good health in few days.

Discussion

Depressed fracture is quite common in traumatic brain injury. Though usual mechanism of this is assault but direct head on collision with sharp and strong object may also cause similar injuries. If the force involved is powerful than the depressed segment can go deep inside the brain parenchyma.

In this type of cases finding a deep fractured segment sometimes become cumbersome intraoperatively. Use of intraoperative imaging for instance MRI, CT Scan and O arm demands costly, complicated and technically demanding infrastructure [1-4].

In this type of situation C Arm plays the rescuing role. As It is used in orthopaedic and spine surgeries very frequently, the availability in any trauma centre set up is easy and feasible. All the bone fragments can be localized with minimal radiation exposure. It can be repeated multiple times and can also be used in real time if fluoroscopy is used [5-7].

Conclusion

Image intensifiers (C Arm) can be a substitute of intraoperative monitoring modalities when it comes to bone segment. This inexpensive method can be rescuing sometimes. We used C arm for deciphering the exact location of deep-seated fractured segment in brain parenchyma. This easily available modality can be a savior in such cases.

Bibliography


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