

Current Concept in Management of Chiari Malformation I

Anil Kumar*

Department of Neurosurgery, All India Institute of Medical Sciences, Raipur, India

***Corresponding Author:** Anil Kumar, Department of Neurosurgery, All India Institute of Medical Sciences, Raipur, India.

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Chiari malformation I (CMI) is a fairly common anomaly of the hind brain which is complicated by syringomyelia in about 65% - 85% cases and is responsible for diverse manifestations of the diseases [4]. The patients often require surgery for long-term presenting symptoms, though no definitive criteria are available for surgery [5]. Despite one of the oldest and widely studied subjects in neurosurgery with innumerable publications, there is little consensus on the optimal surgical technique used for surgical decompression. Treatment for asymptomatic patients remain debatable, however surgical decompression is highly recommended in symptomatic patient with cerebrospinal fluid flow obstruction [1,2,4]. The ultimate goal to restore cerebrospinal fluid obstruction is commonly achieved via a variety of surgical techniques including foramen magnum decompression with or without additional C1/C2 laminectomy, with or without dural splitting, duraplasty, tonsillar coagulation/resection and arachnoid lysis [3].

Surgical decompression without duroplasty (only bony decompression) provides the advantages of surgical decompression with similar outcomes, while avoiding the complications of intradural procedures such as cerebrospinal fluid collection in the operative wound, pseudomeningocele or meningitis [1]. It has been found that adding duraplasty to treat Chiari 1 malformation may lead to a greater reduction in concurrent syrinx but this could not be correlated to functional outcome [4,6]. Author has proposed that lower preoperative posterior fossa volume could be taken as a critical factor in deciding surgical strategy, either duroplasty could be added to this group or larger craniectomy could be planned [1,5]. These findings may assist in surgical planning and help in informing patients of anticipated outcomes before undergoing surgery.

It appears from data in the pertinent literature that adding arachnoid lysis and tonsillar resection in surgical strategy did not bring any significant improvement in the clinical outcome, it also entails significant additional risks in the definitive treatment of Chiari 1 malformation [1]. It is also important to rule out craniovertebral junction instability by radiological imaging, as Chiari malformations are frequently associated with craniovertebral junction anomalies. Several studies in the literature have compared foramen magnum decompression with and without duroplasty and concluded no overall difference between osseous decompression with and without duraplasty, which also raises the question of whether the addition of more invasive surgical techniques are truly necessary in all patients [1]. While the optimal surgical procedure for patients with CM-I remains a point of contention, there is a shift away from intradural techniques in favor of a simple, extradural approach (only bony decompression) due to similar rates of clinical and radiographic success, along with a lower complication rate. Intraoperative ultrasonography may help identify the least invasive but most effective surgical strategy on the basis of real-time anatomic and physiological measurements. When surgical decompression is insufficient, a more invasive type of surgery should be performed, with duraplasty or more laminectomy [1].

It is a well established fact that that the clinical improvement in CMI patients does not essentially correlate with radiological improvement [4]. We advocate neurosurgeons should emphasis on the functional outcome rather than radiological findings after surgical decompression and a residual syrinx can be followed over time if it does not increase and there are no changes in the clinical status. The

management of Chiari 1 malformation cannot be fit into a simple algorithm and these complex patients must be managed on an individual basis, with consideration of the clinical and radiographic presentation.

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