AnastoClip Dural Closure In Minimally Invasive, Intradural Spine Surgery

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Objectives

The AnastoClip is a nonpenetrating titanium clip originally intended for vascular anastomosis. We have used the AnastoClip GC® Closure System to repair spinal dura at our institution after minimally invasive, intradural spine surgery (MIISS). We aimed to assess the rate of postoperative cerebrospinal fluid (CSF) leak along with other complications after AnastoClip repair of spinal dura following MIISS.

Methods

The Neurosurgery patient database at our hospital was reviewed for all patients who underwent MIISS from 1/1/2010 to 4/30/2023, using a tubular-based Mast Quadrant™ Retractor System (Medtronic Sofamor Danek USA, Inc., Memphis, TN, USA). Twenty-six patients were identified in whom the AnastoClip GC® Closure System (LeMaitre Vascular ULC, Vaughan, Ontario, Canada) was utilized after intentional intraoperative durotomy. Variables collected by retrospective case review include age, gender, surgery performed, spinal region, dural graft usage, dural sealant usage, pathology, postoperative CSF leak, and other postoperative complications.

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Results

Fourteen adult male (53.8%) and 12 female (46.2%) patients ages 28-81 years underwent minimally invasive intradural laminotomies (19.2%, n=5), laminectomies (77%, n=20), and hemilaminectomies (3.8%, n=1), all with intentional dural opening repaired with AnastoClips. Fourteen (53.8%) received DuraGen onlay graft (Integra LifeSciences Corporation, Plainsboro, NJ, USA), while the rest received no dural graft. Dural sealant was used in 10 patients (38.5%). The most common pathology was tumor (n=16, 61.5%) followed by syringomyelia (n=4, 15.4%), cyst (n=3, 11.5%), hematoma (n=2, 7.7%), arachnoid web (n=1, 3.8%), and tethered cord (n=1, 3.8%,). None of the 26 patients suffered postoperative CSF leakage. Three (11.5%) had urinary retention or incontinence postoperatively while one (3.8%) had a hematoma that required evacuation.

Conclusions

The AnastoClip system can be safely used though a minimally invasive tube system. Preventing CSF leak enhances patient outcomes by reducing hospital length of stay, decreasing morbidity, and decreasing associated secondary complications.