The cause of non-hindbrain-related syringomyelia includes localized meningeal fibrosis due to spinal cord trauma, infection, kyphosis, or reaction to Pantopaque (1). Posttraumatic syrinx is seen in 1-3% of paraplegic patients (2). The most common symptom is pain (2-4), followed by sensory loss, progressive weakness, and hyperhidrosis (4). The decision to surgically treat a patient with syringomyelia is complicated by the fact that the natural history of syringomyelia may include clinical stability without progression or resolution (4).

Various surgical techniques are used in therapeutic management for the symptomatic syringomyelia, yet with frequent recurrence (1, 2, 5, 6). Percutaneous drainage of syringomyelia may result in temporary symptomatic relief, but usually recur (7). In a population where the surgical risk may be unacceptable, however, multiple percutaneous drainage procedures may provide a rational therapeutic alternative. We report a patient with symptomatic syringomyelia involving the thoracic spine, which was managed by repeated CT-guided percutaneous aspiration procedures.

**Case Report**

A 70-year-old female presented a 3-month history of an increasing numbness and weakness in her lower extremities. Five years ago, she had had a traffic accident with fracture involving her left femur treated with hip replacement. She had mild lower back pain at that time, but without evaluation or treatment. Neurologic examination revealed weakness in both lower extremities. Sensory examination revealed decreased sensation at the level below the L3 dermatome. An MR examination showed a large cyst involving the spinal cord at the level from T10 to T12 vertebral body levels, with marginal thinning of the spinal cord (Fig. 1). Because the patient did not want surgery, CT-guided percutaneous aspiration was performed (Fig. 2). The patient was placed in a prone position, a radiopaque marker was placed on the back to locate the midline, and angled axial images was obtained with the gantry tilted to the angle parallel to...
the interspinous space at T11-12. Subcutaneous and intramuscular 1% lidocaine was administered. A 22 gauge Chiba needle was advanced to the level of the dura, and after passing it, the needle position and alignment were confirmed with a subsequent CT scan. The needle was next advanced into the middle of the syrinx cavity. Clear fluid was initially returned (7.5 cc). Postaspiration CT demonstrated no evidence of hematoma. Postprocedural T2 weighted sagittal MR demonstrated significant decompression of the syringomyelia. The patient noted an improvement in her lower extremity weakness following the procedure.

The patient sustained clinical improvement for 30 months after initial aspiration procedure before the recurrent symptoms of motor and sensory changes developed and progressed over the following 3 months. Follow-up MR at 33 months after the initial drainage procedure revealed recurrent syringomyelia. Additional percutaneous aspiration was done, and the patient once again noted an immediate improvement of her symptoms without periprocedural complication.

During the total follow-up period of 89 months from initial treatment, four additional percutaneous aspiration procedures were performed, at the average duration of 22 months (range: 15-33 months). The average volume of aspirated fluid was 7.45 cc (range 7.3-7.6 cc) for five times of procedure. Until the last clinical follow-up, the patient sustained clinical improvement for 8 months after the last aspiration procedure.

**DISCUSSION**

The treatment of post-traumatic syringomyelia without tethering consisted primarily of shunting of the syrinx (5, 8). Recent reports of syrinx treated by cyst fenestration and an expansile duraplasty have been encouraging (6, 8, 9). The clinical outcome of both medical and surgical management of spinal cord cysts, however, has historically been disappointing. Despite shunting of the cyst to the pleural, peritoneal, or subarachnoid space, clinical improvement has not been long-lasting, and revision shunt surgery is rather frequent (5, 6, 10). A shunt failure rate of 50% as well as high rates of revision surgeries have been reported (1, 2, 5, 6). Shunt placement is further associated with fibrotic reaction and arachnoiditis. Although with the radiologically proven decompression, almost half of the patients reported a continued worsening of their symptoms (2). Conversely, not merely complete drainage but even a mild to moderate reduction in size of the syrinx may result in good clinical outcome (3).
Although the percutaneous drainage of a syrinx improves the patient's symptom, the patient may return with reaccumulation of the syrinx (2, 7). Percutaneous drainage of syringomyelia, however, may have several roles in patient management (7). First, percutaneous drainage can provide a more definite method for confirming the symptomatic nature of syringomyelia in a patient with atypical symptoms. Second, percutaneous drainage may facilitate a subsequent surgical procedure by increasing access to the subarachnoid space by collapsing the cord. Lastly, in a population where the surgical risk may be unacceptable and the utility of surgery unknown, multiple percutaneous drainage procedures may provide a rational therapeutic alternative. The patient in our case refused to have surgery and decided percutaneous aspiration which had been done at the outpatient clinic. Although the effect of percutaneous aspiration may be temporary, the risk for the procedure is at least same as those of myelotomy (2, 7). We did not experienced any perioprocedural complication for the five times of percutaneous aspiration procedures performed for this single patient.

The mean volume of aspiration to collapse the syrinx in our case was 7.46 cc (7.3-7.6 cc), and average duration between the repeated percutaneous aspirations was 22 months (15-33 months). For the aged patient who does not want surgery, management of symptomatic syringomyelia by repeated percutaneous aspiration with more than a year or two of interval may be an acceptable therapeutic alternative.

The CT-guided approach can correlate with MR findings, and minimize the risk of damaging any functional cord by identifying the thinnest portion of
the cord. With the gantry tilted parallel to the interspinous space at an aimed level of percutaneous aspiration, we can visualize entire length of the inserted needle along the course of interspinous space as well as the needle location within the syrinx cavity before drainage is begun. The results and potential complications can also be seen immediately after the drainage is finished.

In conclusion, repeated CT-guided percutaneous drainage of syringomyelia is a safe technique, and can be therapeutic alternative to surgery with temporary improvement of the symptom in the management of the selected patients in risk for surgery.

References

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Key Words: Computed tomography; Percutaneous biopsy; Syringomyelia

Fig. 3. Postprocedural T2 weighted sagittal MR demonstrating significant decompression of the syringomyelia.