

## **The Association between Intratumoral Flow Void Sign on MRI and Intraoperative Blood Loss in Palliative Surgery for Spinal Metastatic Tumors**

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### **INTRODUCTION:**

Metastatic spine tumor surgery (MSTS) is a challenging procedure that requires better anticipation of blood loss. Numerous previous studies on the amount of blood loss have not provided a consensus regarding the typical volume of blood lost during the surgery. The presence of flow void within the tumor has been reported in cases of bone metastasis. We therefore conducted a study with patients who underwent MSTS to investigate the relationship between intratumoral flow void on MRI and intraoperative blood loss.

**METHODS:** We retrospectively examined 82 patients who underwent palliative surgical treatment for spinal metastasis at our hospital between 2010 and 2020. We investigated the amount of intraoperative blood loss and the presence of flow void within the tumor on preoperative MRI. For flow void, we divided the patients into two groups based on the diameter of the blood vessels: a group with blood vessel diameters less than three millimeters and a group with three millimeters or more.

**RESULTS:** Intratumoral flow void was detected in 67.1% (55/82); 13.4% (11/82) belonged to the group with blood vessel diameters more than three millimeters. The mean volume of blood loss in the group without flow void was 151 ml, whereas in the group with flow void, it was significantly larger at 430 ml. The average volume of blood loss in the group with flow void exceeding three millimeters in diameter was 610 ml, while the group with flow void less than or equal to three millimeters had an average volume of 389 ml. Although there was a difference of blood loss between the two groups, it was not statistically significant.

**DISCUSSION AND CONCLUSION:** This study demonstrates a significant correlation between the presence of flow void within the tumor and intraoperative bleeding during palliative surgery for spinal metastasis.