



Bone wax technique and hemostatic procedures in endoscopic spine surgery

Marcelo Campos Moraes Amato[^]

Instituto de Medicina Avançada, São Paulo, SP, Brazil

Correspondence to: Marcelo Campos Moraes Amato, MD, PhD. Instituto de Medicina Avançada, Av. Brasil, 2283, Jardim América, São Paulo, SP, Brazil. Email: marcelo@amato.com.br; amato@neurocirurgia.com.

Comment on: Inoue T, Joko M, Saito F, *et al.* Bone wax technique for full-endoscopic lumbar laminotomy. *J Spine Surg* 2023;9:98-101.

Keywords: Full-endoscopic spine surgery (FESS); hemostasis; intervertebral disc displacement

Submitted Jan 04, 2023. Accepted for publication Jan 30, 2023. Published online Feb 17, 2023.

doi: 10.21037/jss-23-1

View this article at: <https://dx.doi.org/10.21037/jss-23-1>

The interesting article (1) provides us the knowledge of an important tool for endoscopic spine surgery. As reported by the authors, surgeons usually do not use wax during endoscopic spine surgery due to difficulty in handling it adequately. Without a specific nozzle applicator, the bone wax would stick to the working channel of the endoscope and result in a build-up of material on the endoscope lens, obfuscating the visual field and most would not adequately reach the bleeding target.

Hemostasis may be difficult to handle in full-endoscopic spine surgery (FESS), especially for those surgeons starting their learning curve. Before learning how to handle bone wax, it is very important to master the use of the bipolar electrode, the irrigation system, as well as to understand the anesthetic procedures and proper patient positioning that may prevent a bleeding procedure.

Bipolar electrode

Tips previously reported by Hofstetter *et al.* (2), recommend that bipolar cautery works more efficiently by compressing the bleeding vessel with the tip and activating coagulation. It is then understandable why in the case of bone bleeding, the bipolar cautery might not be as effective since vessels are usually located within the spongy bone trabeculae and cannot be compressed. The Surgi-Max[®] system, which emits high radiofrequency, low -temperature radio waves,

has a “bipolar turbo” mode which allows much more effective control of bone bleeding than the conventional bipolar mode or other conventional systems. Although radiofrequency generators from Joimax[®] and RichardWolf[®] can also be configured to better control bone bleeding, it is important that the surgeon know details of the system that will be used prior to the beginning of the surgery, particularly before bone bleeding starts.

Irrigation

As a general rule, the irrigation pressure should be lower than the patient’s diastolic blood pressure, and the initial default settings suggested are 50 mmHg of pressure and flow rate of 0.400 L/min (2). Increasing irrigation pressure or putting a rubber sealer on the working channel and/or the end of the cannula to minimize fluid egress are effective maneuvers to stop bleeding. However, these methods should be used carefully and for a short period as it might increase intracranial pressure, especially if there is a dural tear (3,4). The surgeon must not forget to return irrigation pump parameters to previous condition after the bleeding is controlled.

Positioning

Proper use of cushions to prevent inadequate pressure over

[^] ORCID: 0000-0002-8673-1992.

the abdomen and pelvis is important to prevent surgical bleeding. During the surgical procedure, it is also possible to incline the surgical table to keep the operating site above the heart level, i.e., Trendelenburg for lumbar procedures or reverse Trendelenburg for cervical procedures, as an efficient method to diminish bleeding.

Anesthetic procedures

A very efficient strategy to control bleeding during FESS, as well as to other type of surgeries, is to keep the blood pressure low as long as clinical conditions of the patient allow. The incidence of bleeding complications can be dramatically avoided when basic principles are consistently followed.

Conclusions

When a specific point of the bone is bleeding, the surgeon can first try the three faster maneuvers rather than the bone wax; (I) use of the “turbo” mode of the Surgimax® bipolar system, (II) use of a diamond burr directly over the bleeding point and (III) grasping the bone with the Kerrison rongeur without cutting it, the idea being to squeeze the blood vessels within the spongy bone. If the bone suddenly starts bleeding from different points, the surgeon should first check primary hemodynamic parameters, since it is very likely that the patient is experiencing high blood pressure levels. Then the above mentioned maneuvers can be attempted, while increasing the irrigation pressure or closing the water scape (irrigation system) to allow sufficient visualization to manage the bleeding. If the desired result is not achieved, the bone wax technique described by Inoue *et al.* is of great value (1).

Acknowledgments

The author expresses his thanks to Mr. Timothy Coyne for language help.

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Journal of Spine Surgery*. The article did not undergo external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at <https://jss.amegroups.com/article/view/10.21037/jss-23-1/coif>). Several private distributors of endoscopic instruments and materials pay the author to help develop their companies (Fusão, Surgicare, Device, MedVix, Orthosystem, Cortical, Medical Support, Tecneuro and Ene Medical) and to help surgeons in their cities to perform full-endoscopic spine surgeries. The author has no other conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Inoue T, Joko M, Saito F, et al. Bone wax technique for full-endoscopic lumbar laminotomy. *J Spine Surg* 2023;9:98-101.
2. Hofstetter CP, Ruetten S, Zhou Y, et al. *Atlas of Full-Endoscopic Spine Surgery*. New York: Thieme, 2020.
3. Choi G, Kang HY, Modi HN, et al. Risk of developing seizure after percutaneous endoscopic lumbar discectomy. *J Spinal Disord Tech* 2011;24:83-92.
4. Joh JY, Choi G, Kong BJ, et al. Comparative study of neck pain in relation to increase of cervical epidural pressure during percutaneous endoscopic lumbar discectomy. *Spine (Phila Pa 1976)* 2009;34:2033-8.

Cite this article as: Amato MCM. Bone wax technique and hemostatic procedures in endoscopic spine surgery. *J Spine Surg* 2023;9(1):19-20. doi: 10.21037/jss-23-1