Access this article online
Quick Response Code:

Website:
www.neurologyindia.com

DOI:
10.4103/0028-3886.284373

New Perspectives for a Clean, Almost Bloodless Surgical Field in Transsphenoidal Pituitary Surgery

Vitaliano Francesco Muzii

I have read with great interest the article by Ritesh Lamsal *et al*. about the use of tranexamic acid (TXA) in transsphenoidal surgery (TSS) for pituitary adenomas. The authors conducted an excellent double-blinded placebo-controlled randomized trial, investigating the impact of intraoperative infusion of TXA on the amount of bleeding during elective pituitary surgery by a transsphenoidal approach.

While major bleeding, as in the case of accidental internal carotid artery piercing, may have disastrous, life-threatening consequences, even continuous oozing from cavernous sinus may seriously disturb the surgeon's work, leading to a significant waste of time and blood. With either microscopic or endoscopic view, constant suctioning can be difficult, due to the extremely narrow working corridor, so that moderate or even minor bleeding may conceal the relevant anatomy and hinder the identification of the tumor within to normal gland. This may result in incomplete tumor resection, pituitary damage, and injury to major vessels and sinus, turning a feasible, safe operation into a failure, if not a catastrophe.

Various methods and medications to produce a bloodless field have been investigated.[1] However, the literature about management of blood loss during TSS is scanty and inconsistent.[2] Then, the authors should be commended for undertaking such a well-designed and accurate study; the results of which may help in making this kind of surgery safer and easier.

While TXA is commonly used in some surgical specialities with an intrinsically bleeding surgical field, such as cardiac and orthopedic surgery, its use in neurosurgery is scarcely reported.[3] However, this paper encourages further investigation to explore the possible advantages and a more extensive use of TXA in some neurosurgical applications with typically bleeding fields, like in brain tumor and spine surgery.[4]

In this study, blood loss was assessed with the Boezaart scale and the modified Gross formula.[5,6] A reappraisal of Boezaart scale is welcome, since it is a simple and reliable method to qualitatively assess intraoperative bleeding. It should be routinely used in the surgical report for a more accurate description of the procedure, somehow describing its difficulty, and for purpose of clinical interpretation, research and, not negligible, medical liability implications. Gross formula, and its modification, is also a smart, simple method to estimate overall blood loss, which deserves a more extensive use in neurosurgery. Actually, it is easier and more reliable than checking the suction bag and all absorbing materials from the surgical fields, and rinsing fluid used, a common practice proving tedious and inaccurate. Moreover, this method is based on hematocrit, which is a fundamental parameter of patient homeostasis, far beyond a mere estimation of blood loss.

In Ritesh Lamsal study, TXA infusion has proven a safe method in reducing intraoperative blood loss in TSS, although typical adverse effects like seizures and thromboembolic events were not assessed. On the other hand, it would be interesting to study the potential benefit of TXA in reducing postoperative hematoma in TSS, as well as in neurosurgery in general.

Hemodynamic stability is a mainstay during general anesthesia; however, there is a delicate balance between controlled hypotension to reduce bleeding and the avoidance of hypotensive neurological damage with a very

Department of Medicine, Surgery, and Neuroscience, Section of Neurosurgery, University of Siena, Siena

Address for correspondence:
Prof. Vitaliano Francesco Muzii, Department of Medicine, Surgery, and Neuroscience, Section of Neurosurgery, University of Siena, "Santa Maria alle Scotte" University Hospital, V.le Bracci 1, 53100 - Siena, Italy.
E-mail: muzii@unisi.it

How to cite this article: Muzii VF. New perspectives for a clean, almost bloodless surgical field in transsphenoidal pituitary surgery. Neurol India 2020;68:528-9.

narrow path to walk.[5] Although different anesthetic drugs can affect hemodynamics and potentially decrease local bleeding in different ways, it is still debated if total intravenous anesthesia (TIVA) is superior compared to inhaled anesthesia.[1] In the present study, all patients underwent TIVA, so that the impact of different anesthetic techniques cannot be drawn. However, estimated blood loss was overall limited in both TXA and placebo groups, with a mean blood loss of 334 and 495, respectively, and no patient needed a blood transfusion. I think that TIVA may have a positive impact on surgical bleeding in neurosurgery, especially when venous bleeding is mainly concerned, like from cavernous sinus in TSS or epidural venous plexus in spine surgery. This study, while supporting the effectiveness of TXA in decreasing blood loss in TSS, also suggests an intriguing beneficial synergism of TXA infusion and TIVA, which could be the subject of future investigation.

References

1. Cote DJ, Burke WT, Castlen JP, King CH, Zaidi HA, Smith TR, *et al.* Safety of remifentanil in transsphenoidal surgery: A single-center analysis of 540 patients. J Clin Neurosci 2017;38:96-9.
2. Cafiero T, Cavallo LM, Frangiosa A, Burrelli R, Gargiulo G, Cappabianca P, *et al.* Clinical comparison of remifentanil-sevoflurane vs. remifentanil-propofol for endoscopic endonasal transphenoidal surgery. Eur J Anaesthesiol 2007;24:441-6.
3. Hooda B, Chouhan RS, Rath GP, Bithal PK, Suri A, Lamsal R. Effect of tranexamic acid on intraoperative blood loss and transfusion requirements in patients undergoing excision of intracranial meningioma. J Clin Neurosci 2017;41:132-8.
4. Cheriyan T, Maier SP 2nd, Bianco K, Slobodyanyuk K, Rattenni RN, Lafage V, *et al.* Efficacy of tranexamic acid on surgical bleeding in spine surgery: A meta-analysis. Spine J 2015;15:752-61.
5. Boezaart AP, van der Merwe J, Coetzee A. Comparison of sodium nitroprusside- and esmolol-induced controlled hypotension for functional endoscopic sinus surgery. Can J Anaesth 1995;42:373-6.
6. Gross JB. Estimating allowable blood loss: Corrected for dilution. Anesthesiology 1983;58:277-80.