



# Topical hemostatic agents and risk of postoperative hemorrhage after Transoral Robotic Surgery

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## Importance

An important complication of transoral robotic surgery (TORS) is postoperative hemorrhage. Airway bleedings have a significant risk of morbidity and mortality. Topical hemostatic agents are routinely used during these procedures, but unlike other hemostatic alternatives, no attempts have been made to study their effectiveness in TORS.

## Methods

A retrospective chart review was IRB approved. The cohort included all adult patients that required TORS from January 1, 2015, to April 1, 2020 in one single institution, by a single surgeon. The following data was obtained: Patient's demographic characteristics, indications for the procedure, previous medical treatment, choice of topical hemostatic agents, additional hemostatic techniques and postoperative bleeding events. In 2017, bovine gelatin matrix with thrombin (BgmT) was substituted by porcine gelatin matrix with thrombin (PgmT) for all procedures, allowing for a natural comparison in time. Level of significance was determined through nonparametric testing (Fisher's exact test).

## Objective

To evaluate frequency of postoperative hemorrhage after using various topical hemostatic agents, during TORS.

## Results

80 procedures were identified, in 78 patients. BgmT was used in 28 procedures (35%), and 2 cases of postoperative bleeding were identified (7%). PgmT was then used in 52 procedures (65%) without observing any bleeding. No significant difference was found between groups ( $>0.05$ ). Both patients that presented with postoperative hemorrhage had been diagnosed with oropharyngeal carcinoma centered in the base of tongue. In both cases external carotid branches had been ligated (facial, lingual and ascending pharyngeal). Rate of postoperative hemorrhage in the study population: 2.5%

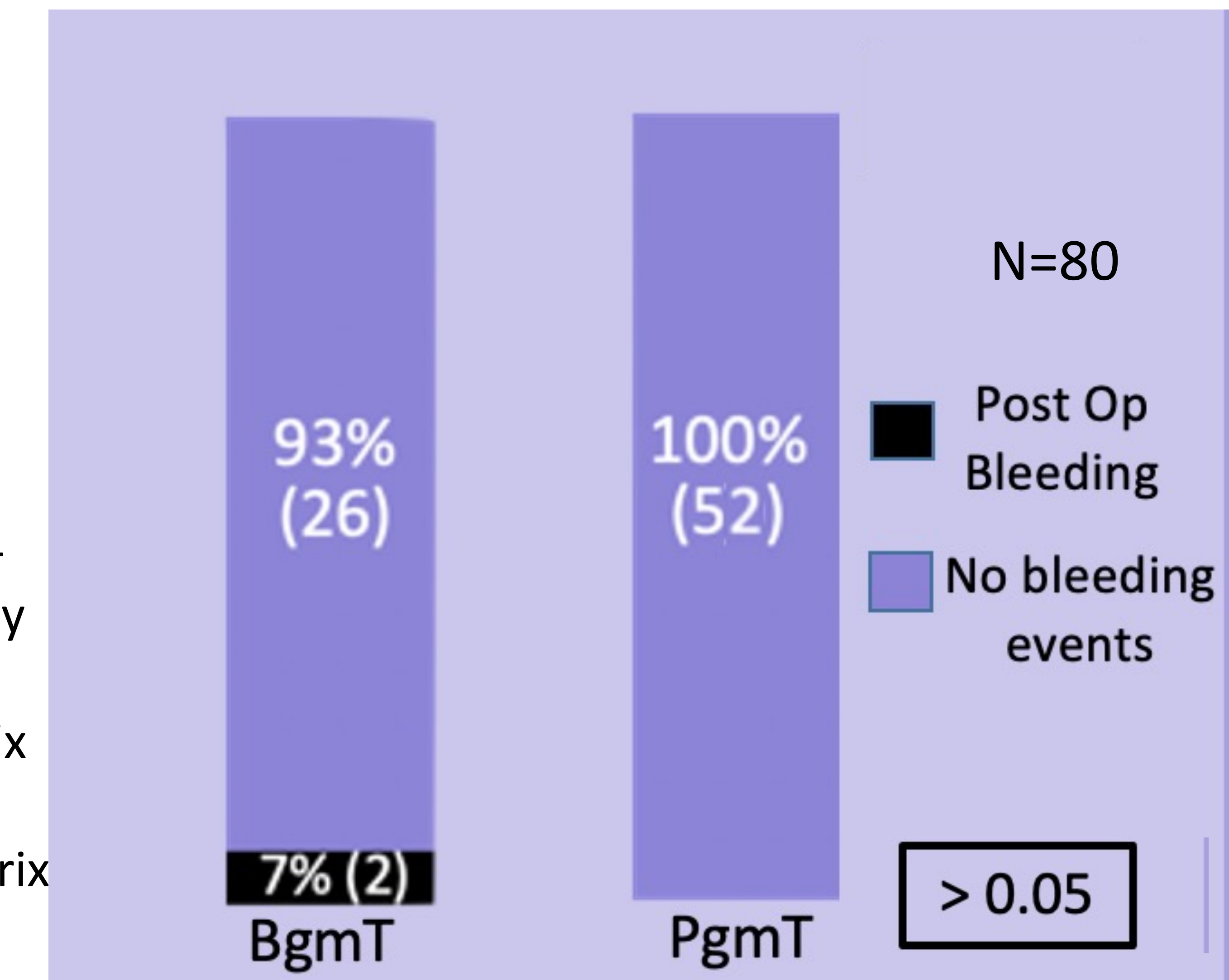
## Conclusion

This is the first study to evaluate the use of topical hemostatic agents in a cohort of TORS procedures. There was no significant difference in postoperative bleeding events between groups, indicating equivalence between hemostatic agents. Larger studies are required, but their sheer simplicity of use, and overall low cost, could still support the routine use of topical hemostatic agents. This is particularly justified, when considering the dire outcomes of airway bleeding.

|            | Number of procedures | Age (mean) | Sex             | Cancer diagnosis | Previous oncological Tx | Lig. Vessels  |
|------------|----------------------|------------|-----------------|------------------|-------------------------|---------------|
| BgmT group | 28                   | 59.6       | M 82% -F 18%    | Y 89% - N 11%    | Y 11% - N 89%           | Y 75% - N 25% |
| PgmT group | 52                   | 57.1       | M 75%-F 25%     | Y 81% - N 19%    | Y 13% - N 87%           | Y 60%- N 40%  |
| Total      | 80                   | 58         | M 77.5% F 22.5% | Y 84% - N 16%    | Y 12.5% - N 87.5%       | Y 64% - N 36% |

**Table 1** .TORS procedures performed between 2015-2020 at SIU Otolaryngology – H&N Department. BgmT Bovine gelatin matrix with Thrombin. PgmT :Porcine gelatin matrix with Thrombin. Lig: Ligation of Ext carotid branches

**Figure1** TORS procedures performed between 2015-2020 at SIU Otolaryngology – H&N Department. BgmT Bovine gelatin matrix with Thrombin. PgmT: Porcine gelatin matrix with Thrombin



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