The efficacy of adjunctive local tranexamic acid for blood salvage in patient undergoing palliative decompressive spinal metastasis surgery

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Introduction

Palliative decompressive spinal metastatic surgery is associated with massive perioperative and postoperative blood loss and transfusion rate. The mean blood loss of more than 1000 ml with more than 0 U blood transfusion was reported. Many methods are used to minimize peri- and post-operative bleeding. Intravenous tranexamic acid (TXA) has shown to reduced blood loss and proportion of patients receiving a blood transfusion in spine surgery. Concerning in thromboembolic events and cardiovasculcar complications, topical tranexamic acid (TXA) was used in traumatic or degenerative spinal surgeries and showed similar efficacies compared with intravenous route but there was no study examined the efficacy of TXA in palliative decompressive spinal metastatic surgery.

The present study examined the efficacies of adjunctive TXA in term of post-operative blood loss and packed red cells (PRC) transfusion in patient underwent palliative decompressive spinal metastatic surgery due to malignant epidural spinal cord compression.

Method

This single-center, randomized, double-blind, placebo-controlled study was conducted at the Department of Orthopaedics, Faculty of Medicine, Chiang Mai University, Thailand. The trial included 65 patients undergoing palliative decompressive spinal metastatic surgery according to malignant epidural spinal cord compression. The trial was approved by Institutional ethical board committee, Faculty of Medicine, Chiang Mai University (ORCT2561-05719), and registered with Thai Clinical Trial Registry.co.th (TCTR2019BO83101).

Patients with malignant epidural spinal cord compression who underwent palliative decompressive spinal surgery and were > 18 years of age and able to give informed consent were screened for inclusion. Patient were, in general, not excluded on the basis of comorbidity; however, exclusion criteria were known allergic reaction to TXA, coagulopathy, history of thromboembolic events, renal insufficiency with creatinine level ≥ 2 mg/dL, pregnancy, lactation, or high-risk surgery (American Society of Anesthesiologist level 4).

Randomization was performed using computerized stratified block randomization in hypervascular (hepatocellular carcinoma, renal cell carcinoma, thyroid cancer and hematologic malignancy) and non-hypervascular tumor. Intention to treat analysis was used in our study.

![Standard General Anesthetics] (1 g tranexamic acid, 30 mins before skin incision)
[Same technique and same orthopedic surgeon]

- Treatment group
  - 1 g tranexamic acid (20ml)
  - Absorbable gelatin sponge (15x57 cm²)

- Placebo group
  - Normal saline 20 ml
  - Absorbable gelatin sponge (15x57 cm²)

Postoperative blood loss = Total blood loss – Intraoperative blood loss (Gross formula) (Solution container: gauze, sponges)

Table 1: Baseline characteristic

<table>
<thead>
<tr>
<th>Group</th>
<th>Local TXA (N=33)</th>
<th>Placebo (N=32)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraoperative blood loss (ml)</td>
<td>588.39±381.1</td>
<td>648.43±464.98</td>
<td>0.84</td>
</tr>
<tr>
<td>Postoperative blood loss (ml)</td>
<td>790.3±492.97</td>
<td>670.1±626.53</td>
<td>0.24</td>
</tr>
<tr>
<td>Total blood loss (ml)</td>
<td>1379.7±673.10</td>
<td>1318±659.25</td>
<td>0.77</td>
</tr>
<tr>
<td>PRC transfusion within D3 (no. of patients, %)</td>
<td>18 (54.55%)</td>
<td>16 (51.57%)</td>
<td>0.59</td>
</tr>
<tr>
<td>0 unit</td>
<td>12 (36.36%)</td>
<td>10 (31.25%)</td>
<td></td>
</tr>
<tr>
<td>1 unit</td>
<td>3 (9.09%)</td>
<td>6 (18.75%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Postoperative outcome

Discussion and Conclusion

Our study demonstrated that no significant difference between treatment group and placebo in terms of total blood loss, intraoperative blood loss, post operative blood loss and also post-operative PRC transfusion. No complication from tranexamic acid was found in this study.

No additional benefit of adjunctive topical tranexamic acid to standard prophylactic intravenous tranexamic acid for blood salvage and transfusion rate in patient undergoing decompressive spinal metastasis surgery

Reference