

## Post-operative pain control protocol for transoral endoscopic thyroidectomy vestibular approach (TOETVA): reply

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Since our development of transoral endoscopic thyroidectomy vestibular approach (TOETVA) (1), many aspects of this innovative scarless thyroidectomy have begun to be investigated to ensure the safety of the procedure (2-6). Recently, we read a letter to the editor stating that postoperative pain for TOETVA in another institute required more analgesic use to achieve adequate pain control (7). This result was different from ours. Thus, we would like to provide clarification of our pain control protocol and the results achieved in our hospital.

First, our previous reports were focused on an innovative surgical TOETVA technique (1), while subsequent study has focused on the safety of this procedure (2). Thus, the lower visual analog scale (VAS) pain score was a by-product of that evaluation. The authors were also amazed by the results of the pain score. Because of those results, we intend to conduct a prospective study to investigate the pain score directly, the results of which will be reported at a later date.

Second, our current pain control protocol does not require preoperative prophylaxis pain reduction. No percutaneous analgesia (PCS) is inserted or prescribed. Ten mg of Morphine is injected only for endotracheal tube intubation (The dose of morphine depends on age and weight of the patients). During surgery, an additional 2-4 mg of Morphine may be injected in case of high blood pressure. The patient is kept in the recovery room for 2 hours and then transferred to the ward. Two tablets of 500 mg Paracetamol are prescribed for patients who have a VAS score between 3 and 5, while 30 mg of Pethidine is prescribed for patients with a VAS score between 6 and

10. For post-operation Day 0, some patients exhibit slight confusion, especially in the recovery room, because of the anesthesiologic drugs. As a result, we decided not to report the VAS score because full consciousness was not achieved by the majority of the patients. It was very difficult to evaluate the actual pain score for this situation on Day 0. However, all patients were asked for their VAS pain score every 4 hours beginning after midnight. The maximum pain score for each day was recorded for every patient over the course of 3 days. If the patient was discharged from the hospital earlier than 3 days, patients were contacted by phone to ask for their VAS score to fulfill the 3-day postoperative period.

Third, we have conducted more than 600 cases of TOETVA in 3 years up to this point. We retrospectively reviewed the charts to evaluate VAS pain scores and found that the pain scores on Day 0 (if can evaluate) and Day 1 were similar. On Days 0 and 1, 20% of patients required an additional shot of Pethidine, while 35% required Paracetamol. 45% of patients required no analgesic drugs. None of the patients required multiple shots of Pethidine, either at the recovery room or in the ward. No patients required analgesic drugs on Days 2 or 3 after operation.

Fourth, a surgeon from a hospital in Taiwan learnt TOETVA from us, but there are still distinctive details between the two institutes. It is very difficult to specify the exact cause of this differentiation. However, the factors that influence the differences in pain score could be from many factors. Learning curve, hand skill, instruments, technique or CO<sub>2</sub> pressure and flow rate as well as

trauma of the dissected area could all be contributory causes (8). Moreover, many of the surgeons from all over the world who learnt from us have found that the pain of TOETVA is still less than open thyroidectomy (personal communication). Even in Italy (5) and the United States (6), patients have gone home the day after surgery (overnight stay) with less pain.

From our results and our point of view, TOETVA is the most effective minimally-invasive thyroidectomy technique, providing an exceptionally scarless result with less pain. However, we do agree that TOETVA could be benefited by additional study, especially with regard to pain assessment and management. We encourage surgeons and anesthesiologists who are interested in this innovative technique to investigate the topic further.

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## Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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