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Case Report

Clinical Recovery After Conventional vs. Bipolar Vessel-Sealing Tonsillectomy in Chronic Tonsillitis: A Comparative Case Report

[1] Adnan Abdullah*, [2] Asti Widuri, [1] Muhammad Farid, [1] Zuhair Sudrajat Tiyan Mujiono, [3] Banun Intan Isnaini
Email (Corresponding Author) : *Adnan.tehate@gmail.com
[1]Faculty of Medicine, Universitas Ahmad Dahlan, Yogyakarta, Indonesia
[2]Faculty of Health and Medical Sciences, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

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ABSTRACT

Tonsillectomy remains a common surgical intervention for chronic or recurrent tonsillitis, with evolving techniques aiming to minimize complications and accelerate recovery. This case report explores the clinical outcomes of using conventional tonsillectomy compared to the Bipolar Vessel Sealing Device (BVSD) methods. Two male patients, aged 22 and 33, presented with chronic tonsillitis characterized by throat discomfort, odynophagia, and worsening symptoms, including sleep-related breathing difficulties. Both underwent tonsillectomy, one with the conventional Sluder-Ballenger technique and the other with BVSD. Postoperative parameters pain (measured by Visual Analog Scale), bleeding, fever, and time needed to regain the normal diet were monitored for six days. No bleeding or fever was observed in either patient. However, the BVSD technique was associated with significantly lower pain scores, ranging from VAS 5 to 0 by day six, compared to 9 to 3 in the conventional group. Additionally, patients in the BVSD group transitioned to solid food earlier (day 4), while the conventional group required until day 6. These findings suggest improved tissue preservation and faster functional recovery with BVSD. The BVSD technique offers advantages in postoperative pain control and recovery of swallowing function compared to conventional methods. Although limited by small sample size, this case report supports the potential of BVSD as a more patient-friendly and efficient surgical approach for tonsillectomy, warranting further investigation in larger, controlled studies

INTRODUCTION

Tonsillitis is an inflammatory condition of the palatine tonsils, commonly caused by viral infections such as adenovirus and Epstein Barr virus, or bacterial infections like Streptococcus pyogenes[1]. In cases where the condition becomes recurrent or persistent, it can impair the immunological function of the tonsils, leading to chronic symptoms such as sore throat,

odynophagia, halitosis, and even complications including obstructive sleep apnea, peritonsillar abscess, and a notable decline in the patient's quality of life[2].

This procedure is also indicated in cases of tonsillar hypertrophy causing airway obstruction, recurrent tonsillar hemorrhage, suspected malignancy, or obstructive sleep apnea[3]. Clinically, various surgical techniques are available for tonsillectomy, ranging from cold steel dissection and hot dissection using monopolar or bipolar electrocautery, to more advanced methods such as coblation and vessel sealing systems.

Historically, tonsillectomy has been performed since ancient times and remains one of the most frequently conducted ENT surgical procedures worldwide[4]. Common used conventional methods include cold dissection, electrocautery (both monopolar and bipolar), and ligation using sutures. Cold steel dissection is associated with lower rates of primary bleeding but often requires a longer operative time and more meticulous hemostasis[5]. Conversely, electrocautery offers faster procedure times but has been linked to higher rates of postoperative pain and secondary hemorrhage[5].

While hot dissection techniques like electrocautery are widely utilized due to their tissue-separating efficiency, the high temperatures they generate may cause collateral thermal injury to surrounding tissues, thereby elevating the risk of postoperative pain and delayed bleeding. In response to these limitations, the Bipolar Vessel Sealing Device (BVSD) was introduced as a safer alternative. Operating at a lower temperature range (approximately 60–70 °C), BVSD allows for more controlled hemostasis by sealing blood vessels effectively without the need for manual ligation[6].

A number of clinical studies have explored the safety and efficacy of BVSD in tonsillectomy. One double-blind cross-sectional study reported superior performance of BVSD over the harmonic scalpel in terms of operative bleeding control, shorter surgical time, and reduced postoperative pain scores[7]. Additionally, a meta-analysis by Liyun Yang which included data from 12 studies, concluded that BVSD significantly reduced both primary and secondary bleeding risks without substantially increasing postoperative pain[8]. Based on this background, the present case report aims to describe the clinical experience of using BVSD in tonsillectomy for patients with chronic tonsillitis. It also seeks to explore the benefits and potential advantages of this technique when compared to conventional surgical methods.

CASE PRESENTATION

Case Description Two male patients, aged 22 (Mr. X) and 33 years old (Mr. Y), presented with complaints of a persistent lump sensation in the throat, which had been experienced intermittently for approximately the past six months. The symptoms were occasionally

accompanied by pain during swallowing and a sensation of fatigue during physical activity. Both patients had previously received medical treatment and reported temporary improvement; however, in recent months, the symptoms had worsened, particularly with the onset of breathing difficulties during sleep. The patients denied any additional complaints such as cough, nasal congestion, or dysphagia. They also had no history of chronic illnesses, including hypertension, diabetes mellitus, or cardiovascular disease, and no known allergies.

On physical examination, both Mr. X (22 years old) and Mr. Y (33 years old) appeared slightly ill but were in generally good condition. Mr. X had a blood pressure of 120/89 mmHg, a pulse rate of 88 beats per minute, a respiratory rate of 22 breaths per minute, and a body temperature of 36.9°C. Mr. Y's vital signs were comparable, with a blood pressure of 117/79 mmHg, a pulse rate of 76 beats per minute, a respiratory rate of 20 breaths per minute, and a body temperature of 36.5°C. Systemic examinations in both patients were within normal limits. Local examination revealed similar findings: enlarged tonsils graded as T3–T3 bilaterally, with hyperemia, widened crypts, and the presence of detritus the uvula was midline. Routine hematological investigations were within normal ranges. Routine hematological investigations were within normal ranges in both cases.

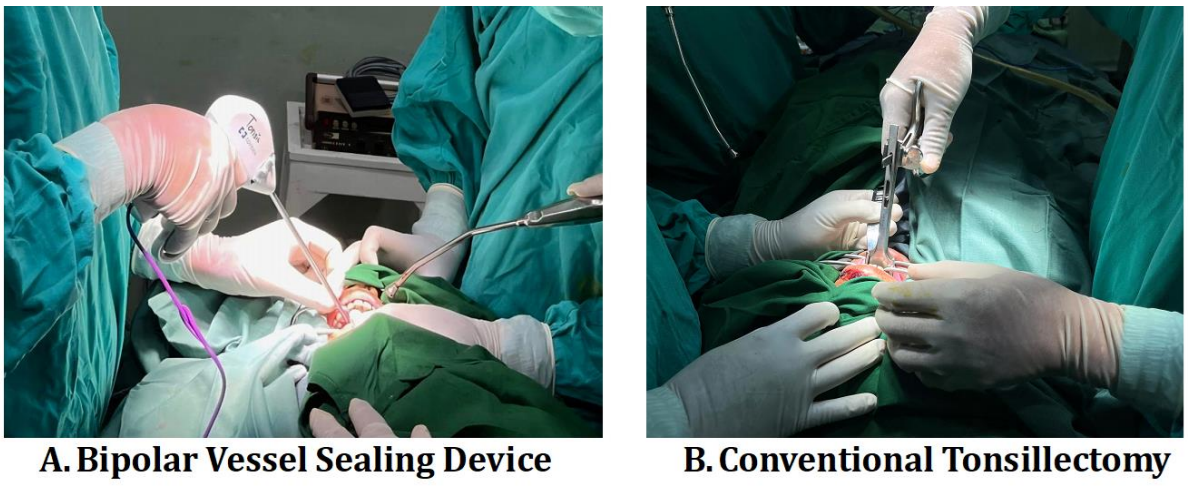

Figure 1. Conventional Tonsillectomy Versus Bipolar Vessel Sealing Device

Both patients underwent surgery under general anesthesia (GA). Following induction, intranasal intubation was performed to maintain airway patency and ensure adequate oxygenation throughout the procedure. The patients were placed in the supine position, and the mouth was opened and stabilized using a mouth gag. In the Bipolar Vessel Sealing Device (BVSD) group, dissection was carried out along the tonsillar capsule using bipolar cautery, allowing for simultaneous dissection and coagulation to minimize intraoperative bleeding. In contrast, the conventional method (Sluder-Ballenger technique) involved encircling the tonsil with the instrument's tip, followed by clamping and dissection. The difference in intervention between the two patients was due to the fact that the BVSD was only newly available at the hospital during the

treatment of the second patient.

Post-tonsillectomy evaluation was conducted based on several clinical parameters: fever, bleeding, swallowing pain measured using the Visual Analog Scale (VAS), and the progression of oral intake from day 1 to day 6, as summarized in Table 1. The evaluation was performed by the attending physician, assisted by a clinical assistant during follow-up visits. Patients were divided into two groups according to the surgical technique used: conventional tonsillectomy and Bipolar Vessel Sealing Device (BVSD). None of the patients in either group experienced fever or bleeding throughout the observation period, indicating the overall safety of both procedures in terms of acute systemic and local complications. However, significant differences were observed in pain levels and functional recovery. In the conventional group, pain during swallowing remained relatively high, with VAS scores ranging from 9 to 3 between day 1 and day 6. In contrast, the BVSD group demonstrated a more rapid and consistent reduction in pain, with VAS scores declining from 5 to 0 over the same period.

Table 1. Clinical presentation of patients

Day	***Fever***		***Bleeding***		***Throat Pain (VAS)***		***Food Intake***	
	Conven	***BVSD***	***Conven***	***BVSD***	***Conven***	***BVSD***	***Conven***	***BVSD***
1	No	No	No	No	9	5	Soft porridge	Soft porridge
2	No	No	No	No	7	5	Soft porridge	Soft porridge
3	No	No	No	No	7	2	Coarse porridge	Soft porridge
4	No	No	No	No	7	2	Coarse porridge	Solid rice
5	No	No	No	No	6	1	Coarse porridge	Solid rice
6	No	No	No	No	3	0	Solid rice	Solid rice

These findings suggest the effectiveness of BVSD in minimizing tissue trauma and local inflammation following surgery. A notable difference was also observed in the progression of oral intake. Patients in the conventional group began with soft porridge and were only able to tolerate solid rice by day 6. In contrast, patients in the BVSD group transitioned to solid food more rapidly, with two patients able to consume solid rice by day 4, indicating a faster recovery of swallowing function. Overall, the BVSD technique provided superior clinical outcomes in terms of pain control and the acceleration of oral intake recovery compared to the conventional method. These outcomes support the use of BVSD as a more efficient and patient-friendly alternative in the postoperative management of tonsillectomy.

DISCUSSION

Postoperative evaluation in this case report was based on several clinical parameters: the presence of fever, bleeding, swallowing pain assessed using the Visual Analog Scale (VAS), and the progression of oral intake from day one to day six. Patients were divided into two groups according to the tonsillectomy technique used in conventional dissection and Bipolar Vessel Sealing Device (BVSD). Throughout the observation period, none of the patients in either group experienced fever or bleeding, indicating both techniques carry a favorable safety profile in the acute phase without notable systemic or local complications.

However, marked differences were observed in pain control and functional recovery. Patients who underwent tonsillectomy using the BVSD technique consistently reported lower pain scores compared to those in the conventional group. In the BVSD group, pain levels gradually decreased from a VAS score of 5 on the first postoperative day to 0 by day six. In contrast, pain levels in the conventional group remained relatively high until day four and only declined to a VAS score of 3 by day six.

This pattern reflects the greater tissue trauma and local inflammation typically associated with the conventional approach. This disparity also had a direct impact on the patients' ability to resume normal oral intake. In the BVSD group, two patients had already transitioned to solid foods such as rice by day four. Meanwhile, patients in the conventional group only achieved this level of recovery by day six. The faster return to solid intake in the BVSD group indicates a quicker recovery of oropharyngeal mucosal function, which is a key functional indicator of postoperative comfort and healing.

Overall, the findings from this case report demonstrate that the BVSD technique offers clinical advantages in postoperative recovery by reducing pain and accelerating the return to normal eating. The BVSD's ability to provide precise hemostasis while minimizing thermal injury to surrounding tissues likely contributes to these improved outcomes. Therefore, BVSD may be considered a more effective, patient-centered alternative to conventional tonsillectomy, particularly in cases of chronic tonsillitis.

The superior performance of BVSD in reducing postoperative pain and facilitating earlier functional recovery aligns with the pain management principles outlined in the systematic review by Aldamluji, which emphasized an evidence-based, multimodal approach involving paracetamol, NSAIDs, and dexamethasone as core therapies, alongside adjuncts such as honey, acupuncture, and gabapentinoids[9]. Although surgical technique was excluded in that review, the meta-analysis by Kang evaluating the BiZact™ device showed that while operative time was significantly reduced, no meaningful differences in postoperative pain or bleeding were found compared to conventional methods[10]. In contrast, this case report demonstrates a consistent reduction in pain

from day one to six and a faster transition to solid food in the BVSD group, highlighting the significant role of minimally traumatic surgical techniques in enhancing postoperative recovery. These findings are further supported by Bagherihagh, who found that harmonic scalpel tonsillectomy resulted in significantly less pain and intraoperative bleeding compared to cold dissection[11]. Moreover, Zagólski reported that patients with a history of recurrent tonsillitis experienced higher postoperative pain and a greater risk of dehydration even when laser techniques were used to reduce trauma indicating that preoperative tissue condition influences recovery[12]. Notably, even in such cases, the BVSD technique still demonstrated superior outcomes in mitigating tissue trauma during chronic tonsillitis surgery.

Hesham also supported the clinical advantages of BiZact™, reporting reduced bleeding and pain compared to cold steel dissection[13]. However, the more conservative findings from Kang highlight the importance of context and study heterogeneity when evaluating new surgical technologies[10]. Regarding oral intake, studies by Millington and Bannister found that dietary restrictions had no significant impact on postoperative morbidity or secondary bleeding[14,15]. In the current case report, the faster recovery of swallowing function observed in the BVSD group appears to be primarily driven by better pain control and patient comfort, rather than dietary modifications, underscoring the importance of selecting a surgical technique that optimally supports postoperative healing and function.

Tonsillectomy, the surgical removal of the tonsils, can be performed using a variety of techniques, ranging from traditional approaches to advanced surgical technologies. The conventional method known as cold steel dissection, which involves the use of scissors and scalpel with ligation, is associated with the lowest rate of secondary bleeding 3.7% (CI: 0.8–6.6%) according to a 2025 meta-analysis comparing surgical methods [16]. However, this technique is not necessarily considered the fastest in terms of recovery. Electrocautery techniques using monopolar or bipolar diathermy have gained popularity due to their effectiveness in achieving hemostasis, reducing intraoperative time, and accelerating recovery, as reported in a retrospective study by Dorkar[17].

The choice between conventional cold steel dissection and BVSD techniques typically depends on several factors including surgeon preference, patient-specific considerations, and available resources[17]. Conventional tonsillectomy is often indicated in cases where meticulous dissection and minimal thermal injury are preferred, such as in patients with increased risk of tissue damage or where cost constraints are a concern. In contrast, BVSD is indicated when a faster procedure with improved hemostasis and reduced intraoperative bleeding is desired, which may benefit patients by potentially reducing operative time and postoperative pain. Both techniques have shown efficacy and safety when performed by experienced surgeons, and the choice is often

tailored to optimize patient outcomes[5].

On the other hand, modern technologies such as coblation, which utilizes low-temperature radiofrequency energy, have demonstrated benefits in minimizing intraoperative blood loss and postoperative pain while promoting quicker return to normal diet and daily activities. Despite these advantages, some studies have noted no significant difference in intraoperative bleeding rates when compared with traditional methods[18]. Coblation with an intracapsular approach has also shown promising results in reducing postoperative bleeding[19].

Intracapsular tonsillectomy, which preserves the tonsillar capsule, has been supported by meta-analyses and retrospective studies for its significant reduction in postoperative bleeding risk (relative risk ~0.36), faster pain resolution (approximately 4 days earlier), quicker return to normal eating (~3.5 days earlier), and earlier resumption of daily activities (~2.8 days sooner) compared to total tonsillectomy. In adult patients, intracapsular tonsillectomy using monopolar electrocautery was also found to result in significantly less bleeding than extracapsular techniques[20]. Additional cohort data reported low 28-day readmission and complication rates, including bleeding (1.2%), infection (0.7%), and return-to-operating-room (0.2%) following intracapsular coblation[21]. Furthermore, a 2024 review concluded that the postoperative bleeding rate of intracapsular tonsillectomy was not significantly different from that of total tonsillectomy[22].

Laser tonsillectomy, or laser tonsil ablation (LTA), utilizes CO_2 or KTP lasers to vaporize tonsillar tissue and reduce its volume, targeting crypts that are prone to chronic or recurrent infections[23]. This approach has shown reduced operative time and intraoperative bleeding compared to cold dissection, though early postoperative pain is comparable and may even be higher on day seven post-surgery[24]. Overall, the choice of tonsillectomy technique whether cold steel, electrocautery, coblation, harmonic scalpel, laser, or intracapsular should be tailored to the patient's individual profile, including bleeding risk, pain tolerance, recovery expectations, and the available clinical expertise and resources. These considerations should be guided by the most recent evidence and clinical outcomes as outlined above.

This case report has several limitations that should be acknowledged. The sample size was limited to only two patients, which restricts the generalizability of the findings. Additionally, the short follow-up period may not capture delayed postoperative complications or long-term outcomes such as recurrence or scarring. Objective measurement tools, such as validated quality-of-life instruments or pain biomarkers, were not utilized, potentially limiting the depth of clinical assessment. For future research, it is recommended to conduct studies with larger, more diverse populations and longer observation periods. Incorporating standardized evaluation tools and comparing multiple surgical modalities under controlled conditions would also provide stronger

evidence for the effectiveness and safety of newer techniques like BVSD in tonsillectomy.

CONCLUSION

The use of the Bipolar Vessel Sealing Device (BVSD) in tonsillectomy for chronic tonsillitis patients demonstrated better outcomes compared to conventional techniques. BVSD significantly reduced postoperative pain and accelerated the recovery of swallowing function, allowing patients to resume solid food intake sooner. Additionally, BVSD provided effective hemostasis without increasing the risk of bleeding or fever. Although this study involved only two patients, the results suggest that BVSD is a more efficient and patient-friendly surgical option. Further research with larger sample sizes and longer follow-up is needed to confirm these findings.

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