

**COMPARATIVE ANALYSIS OF BIPOLAR TECHNIQUE vs.
VESSEL SEALING DEVICES IN
SURGICAL PROCEDURES**

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OVERVIEW

This research study was chosen to perform Research on
**COMPARATIVE ANALYSIS OF BIPOLAR TECHNIQUE vs. VESSEL SEALING
DEVICES INMSURGICAL PROCEDURES**— on its functionalities, benefits, features For
Various Surgical Outcomes **And to promote our Vessel Sealer.**

Primary data are being used in this research.

A survey was conducted on **100 Population Size of Surgeons from Pune Region.**

INTRODUCTION

- Modern surgery is continually advancing, with technology playing a crucial role in enhancing surgical outcomes and patient safety. Electrosurgical devices, especially bipolar electrosurgery (BP) and vessel sealing (VS) devices, are vital for achieving hemostasis during procedures.
- Bipolar electrosurgery, a long-standing technology, uses two electrodes to pass electrical current through tissue, generating heat to coagulate and seal blood vessels. Its precision and minimal thermal spread make it ideal for delicate procedures like General Surgery , Gastro surgery etc., handling small to medium-sized vessels effectively.
- Vessel sealing devices, a newer technology, combine pressure and energy (radiofrequency or ultrasonic) to seal larger vessels (up to 7 mm) and tissue bundles. These devices often include cutting mechanisms, enhancing surgical efficiency in both laparoscopic and open surgeries.
- Choosing between BP and VS devices depends on factors like vessel size, the need for precision or efficiency, potential thermal spread, and specific procedural requirements. Surgeons' familiar with both technologies can optimize patient outcomes by selecting the appropriate tool.
- This comparative analysis will explore the technical principles, applications, advantages, and disadvantages of BP and VS devices, offering a comprehensive understanding of their roles in modern surgery.

OBJECTIVE

- To assess the current situational technique in surgery of Bipolar Electrosurgical technique vs Vessel Sealer.
- To evaluate the satisfaction levels and performance preferences of surgeons using Bipolar and Vessel Sealer technologies across different surgical specialties.
- To compare the Thermal Spread between the Vessel Sealer vs Bipolar Technique.
- To analyze the Ergonomic factor between the Vessel Sealer vs Bipolar Technique.
- To investigate the Teaching and Information aspects with respect to Vessel Sealer vs Bipolar Techniques.

RESEARCH METHODOLOGY

1. Material and Methods:

- **Study Design:** Descriptive Type
- **Setting:** It Would be Primary Research with Goals of Compiling Data from Consultation, Interview on Vessel sealer to Surgeons of Different Specialty.
- **Study Population:** Surgeons of Different Specialties
- **Sample Source:** Primary Research.
- **Study Tool:** MS Excel by Analyzing the Survey of KOL and Surgeons
- **Duration of Study:** 3 Months
- **Sample Size:** 100 Surgeons (General Surgeons, Gynecologists, Oncologists, Gastro surgeons)
- **Population Size:** 100 Surgeons

CALCULATION USING YAMANE FORMULA

When Know the Sample Size or Your Sample Size is Finite We Can Use Yamane Formula

$$n = N / (1 + N * (e)^2)$$

Confidence Level=95%

Where N= Population Size=180

e^2 = Margin of Error=0.05

$$n = 180 / (1 + 180 * (0.05)^2)$$

$$n = 180 / (1 + 180 * 0.0025)$$

$$n = 180 / (1 + 0.45)$$

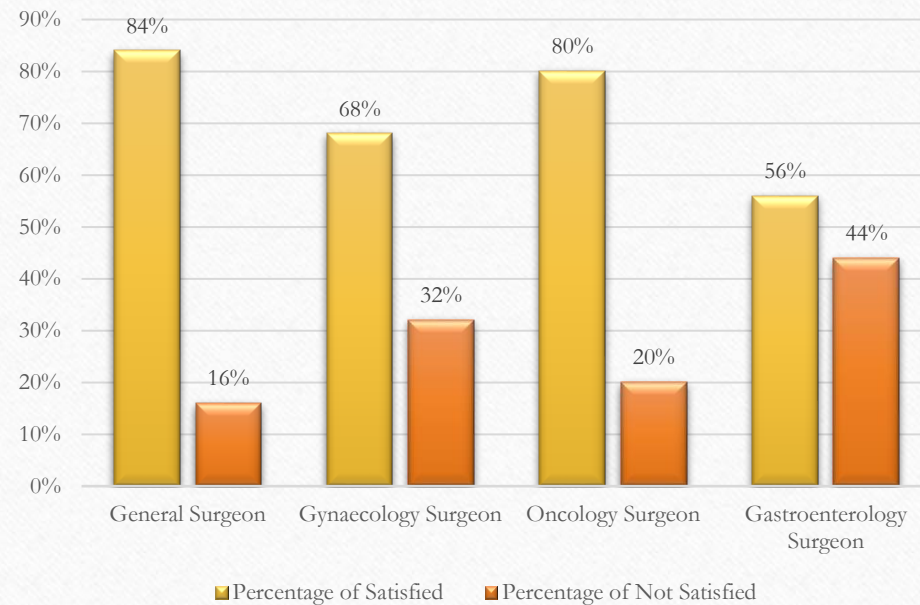
$$n = 124.67$$

So, The Sample Size Needed for a Population of 180 with a 5% Margin of Error at 95% Confidence Interval is Approximately 125

RESULTS AND DISCUSSION

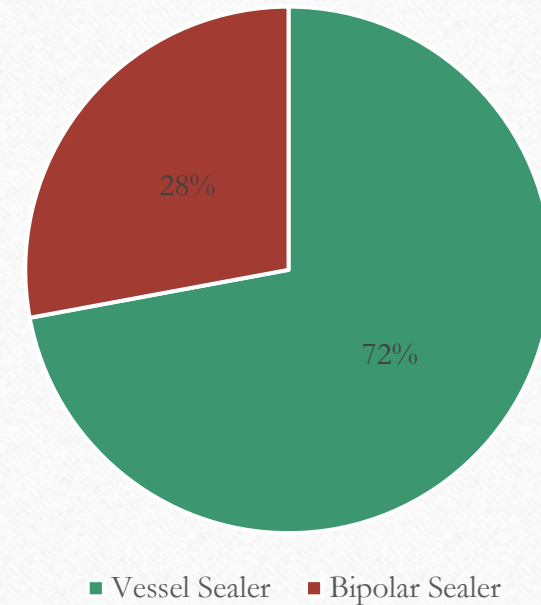
1.

**Surgeons of Different Specialities
Satisfied and Unsatisfied with Vessel
Sealer**



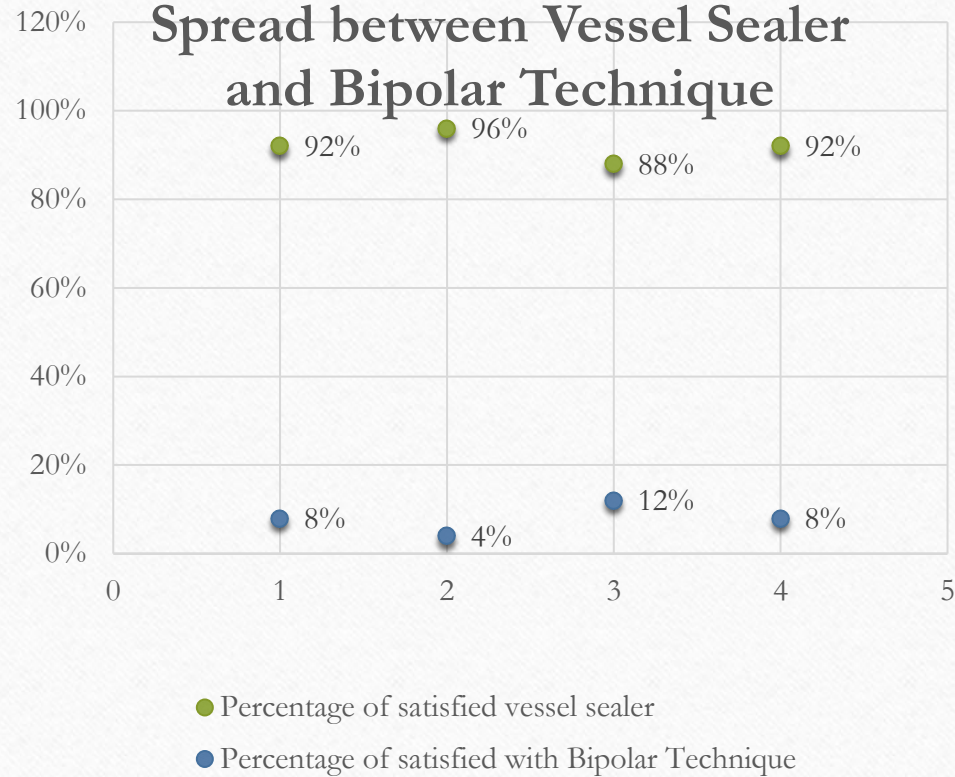
2.

Preference: VS vs. Bipolar Techniques



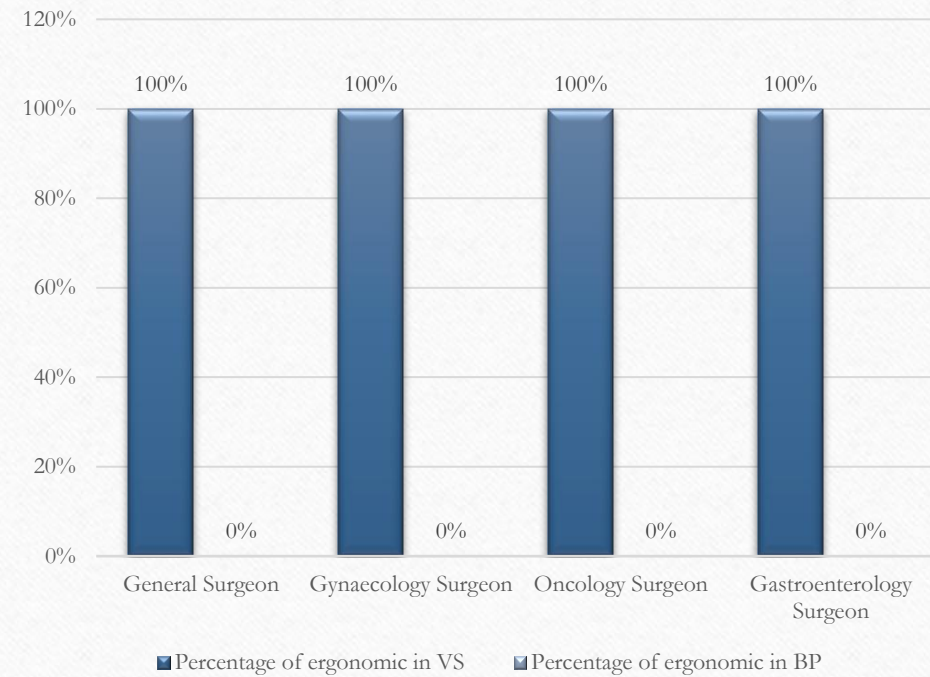
3.

Satisfactory of Thermal Spread between Vessel Sealer and Bipolar Technique



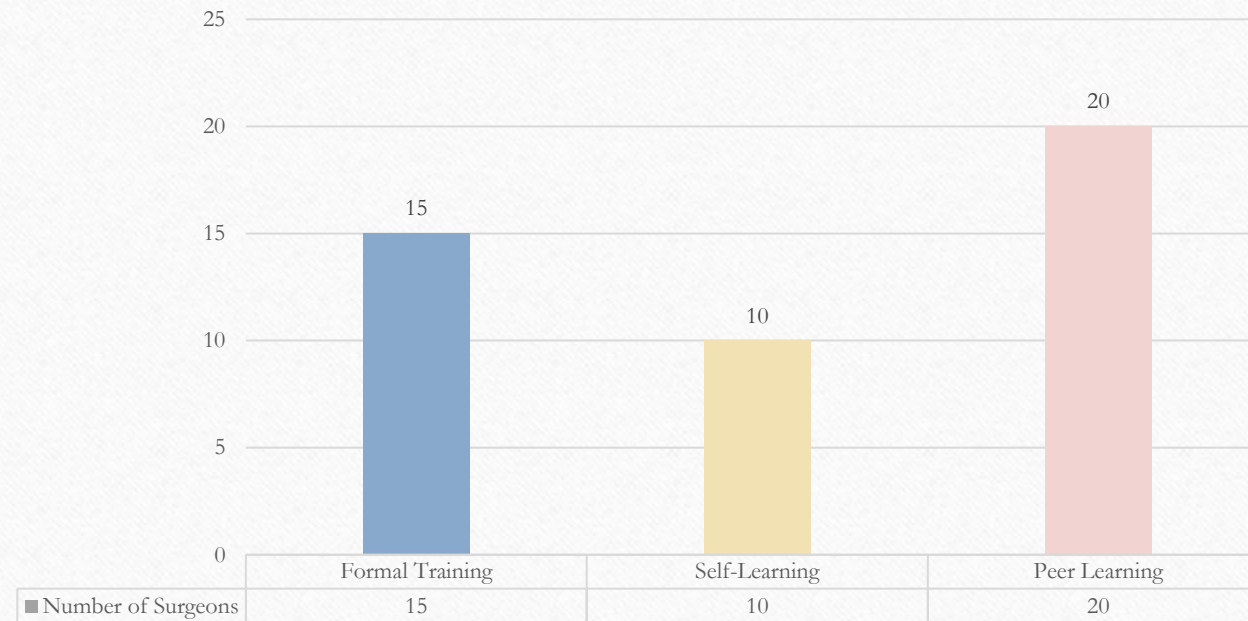
4.

Ergonomic in aspects of VS vs BP



5. To investigate the Training and Learning Curve of surgeons with respect to Vessel Sealer vs Bipolar Technique

Training and Learning Curve of surgeons with respect to Vessel Sealer vs Bipolar Technique



Conclusion

The COMPARATIVE ANALYSIS OF VESSEL SEALERS Vs BIPOLAR ELECTROSURGICAL across various surgical specialties reveals a clear preference for vessel sealers among the surveyed surgeons.

The study include 25 surgeons from each specialty (General Surgery, Gynecology, Oncology and Gastroenterology), highlights several key findings:

When we Observe the Graphs and Responses of the Surgeons of Different Specialty

1. Surgeons Satisfied and Unsatisfied with Performance of Vessel sealer.

General Surgeons: 84% satisfied with vessel sealers, 16% unsatisfied.

Gynecology Surgeons: 68% satisfied and 32% unsatisfied.

Oncology Surgeons: 80% Satisfied and 20% Unsatisfied.

Gastroenterology Surgeons: 56% satisfied, 44% Unsatisfied.

The Primary reasons for satisfaction include the vessel sealer's ability to provide permanent vessel sealing and significantly reduces blood loss during surgeries, thereby enhancing patient safety. On the other hand, some surgeons remain unsatisfied, preferring the familiarity and cost effectiveness of bipolar techniques despite their limitations.

2. Surgeons of Different Specialty Choosing Preference between Vessel Sealer vs Bipolar Technique

This significant preference for VS suggests that a majority of surgeons find these devices more advantageous and beneficial for patient safety. The reasons being efficiency, precision in performance and use during the procedure, reduced blood loss in surgery, and patient safety of patient. On the other hand, Bipolar techniques was preferred by those often-cited familiarity, cost, and the training required for new technology.

3. Satisfactory of Thermal Spread between Vessel Sealer and Bipolar Technique

General Surgeons: 92% satisfied with vessel sealers, 8% with Bipolar.

Gynecology Surgeons: 96% satisfied with vessel sealers, and 4% with Bipolar.

Oncology Surgeons: 88% Satisfied with vessel sealers and 12% with Bipolar.

Gastroenterology Surgeons: 92% satisfied with vessel sealers, 8% with Bipolar.

Surgeons favor vessel sealers for their minimal thermal spread(<1mm) and lack of tissue charring, which contrasts with the greater thermal spread and tissue charring observed with bipolar techniques.

4. To evaluate the Ergonomic aspects of Vessel Sealer vs Bipolar according to different Surgeons.

The survey results show that 100% of surgeons in each specialty found vessel sealers to be ergonomic, whereas none reported bipolar electrosurgery to be ergonomic. This preference is attributed to the vessel sealer's design, which includes features like cold blade for tissue dissection, reducing the need for frequent instrument exchange during surgeries.

5. To investigate the Training and Learning Curve of surgeons with respect to Vessel

Sealer vs Bipolar Technique

Formal Training: 15 surgeons received structured training, leading to high proficiency and confidence in using vessel sealers and bipolar devices.

Self- Learning: 10 surgeons learned independently, resulting in varied levels of expertise.

Peer Learning: 20 surgeons benefited from peer learning, gaining practical insights and tips from experienced colleagues.

Overall, the Study demonstrates a significant preference for vessel sealers over bipolar electrosurgery due to their superior performance in terms of permanent vessel sealing, reduced blood loss, minimal thermal spread, and ergonomic design. While some surgeons remain loyal to bipolar techniques due to familiarity and cost considerations, the overall trend indicates a shift towards adopting vessel sealing technology to enhance surgical outcomes and patient safety.

THANKYOU