Hemorrhoid Energy Therapy

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Abstract

Background: There are a number of modalities for the treatment of Grade I- II hemorrhoids; such as sclerotherapy, band ligation therapy and infrared coagulation. With advancement in minimally invasive technologies, the bipolar tissue ligator provides a different approach to treatment of Grade I-II hemorrhoids.
Methods: A comprehensive literature search using EBSCO host, OVID and PubMed; was performed to identify studies and peer review articles regarding the use of bipolar tissue ligator to treat Grade I - II hemorrhoids.
Keyword search: Bipolar ligator, hemorrhoids, hemorrhoid energy therapy, coagulation.
Discussion: Previous treatment modalities for Grade I – II hemorrhoids have led to postoperative pain and swelling of surrounding tissue. The goal of bipolar ligation treatment is to target the lesion while limiting injury to surrounding tissue; thus leading to decreased pain and swelling post-treatment.
Conclusion: When compared to previous treatment modalities such as sclerotherapy, banding and infrared coagulation; the bipolar ligation therapy has shown to provide a consistent delivery of energy and pressure that leads to tissue destruction of the targeted area with minimal destruction of surrounding tissue.

Methods

A literature review was performed to determine which heat/coagulation treatment for internal hemorrhoids produce the most effective treatment and the least amount of post-procedure tissue damage and discomfort.

A comprehensive literature review was conducted using EBSCO Host, OVID and PubMed to identify peer review articles and clinical studies regarding the use of bipolar energy heat therapy to safely treat Grade I-II internal hemorrhoids. The time frame was limited to articles published from 1/1/2005 to 7/31/2015.

Introduction

Hemorrhoids are enlarged veins in the anus and lower rectum that may bleed, cause severe pain and lead to fecal soiling. According to the National Institute of Health (NIH), there are 10.4 million Americans that suffer from hemorrhoids annually; leading to approximately 3.5 million physician visits at an average annual cost of $500 million (Jutabha, 2009).

Hemorrhoids are one of the most common diseases, presenting in 50 percent of the population over fifty. The extent of the disease is usually determined using the Goligher classification scale (Shah 2011).

The aim of treatment is to reduce blood flow to the hemorrhoid plexus, decrease prolapse and preserve the maximum amount of anoderm tissue; with the least amount of post-procedure pain.

With surgical reduction, large amounts of anoderm may be resected leading to decreased sensory perception in the anal canal. The loss of significant areas of anoderm may lead to decreased sphincter tone which will cause fecal incontinence or stenosis of the anus (Duben, 2013).

Conventional treatment such as banding, injection sclerotherapy and bipolar coagulation is usually adequate for hemorrhoids. Surgical treatment is reserved for patients with Grade III-Grade IV hemorrhoids that fail conventional treatment.
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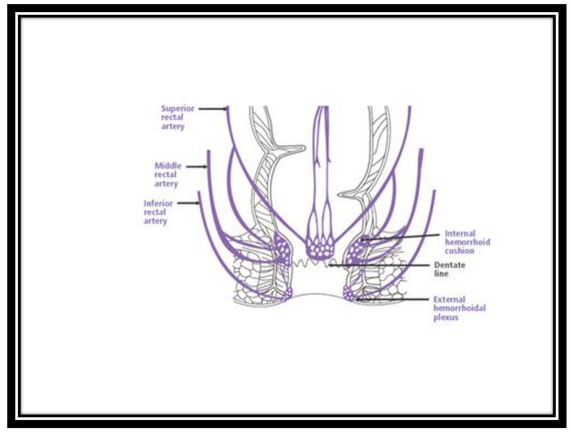
Bipolar electrocoagulation for treatment of hemorrhoids is commonly practiced and "is one of the most effective coagulation techniques for internal hemorrhoid treatment" (Jutabha, 2009).

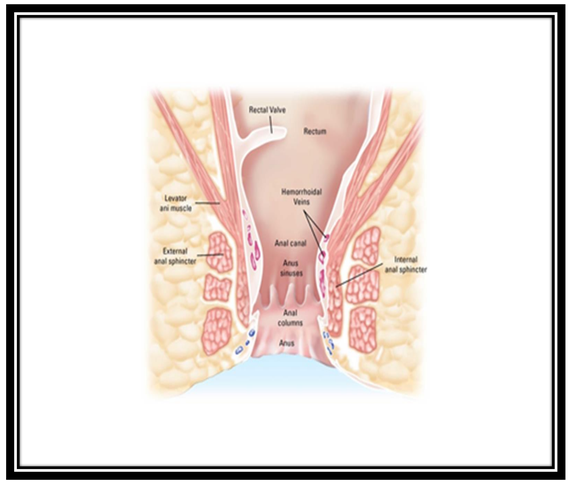
The Heat Energy Therapy (HET) bipolar tissue ligator has a tissue compression mechanism along with a temperature sensor which allows a constant force of compression that is operator-independent and a predictable energy level at 55 degrees Celsius (Piskun, 2012).

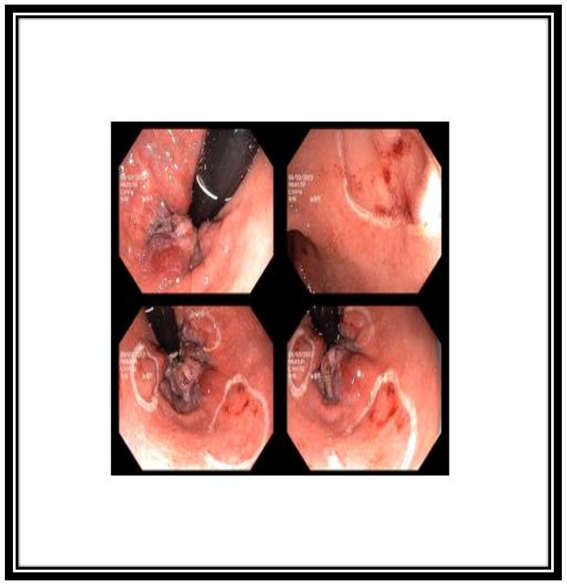
In a study conducted by Piskun and Tucker (2012), an in vivo single animal at multiple treatment sites compared the histologic effects of two bipolar ligation systems on normal recto-sigmoid swine colon. The Redfield IRC device (which does not have a gauge to control compression or a way to measure temperature) and the HET system were used for this study. The effects of thermal treatment on the mucosa, submucosa, submucosal vessels and muscularis layer were evaluated.

Results

The results of Piskun and Tuckers (2012) study showed:
-The IRC group had a greater variability in the temperature at the tissue treatment site when compared to the HET group.
-Consistently compressed tissue in the HET group required less energy that the non-compressed tissue in the IRC group
-There were similar histological changes in the submucosal vessels and submucosa layer in both groups, but the HET group achieved the desired changes using temperatures that were 3 times less than the IRC group.
-In both groups signs of tissue desiccation were observed with some loss of intercellular water was observed; but changes such as loss of normal tissue architecture and complete cellular protein denaturation were not observed.







Conclusion

When compared to previous treatment modalities such as sclerotherapy, banding and infrared coagulation; the bipolar ligation therapy has shown to provide a consistent delivery of energy and pressure that leads to tissue destruction of the targeted area with minimal destruction of surrounding tissue.

Constant tissue compression that is operator independent along with temperature monitoring during hemorrhoid treatment provides more accurate energy delivery to targeted tissue and decreases the amount of damage to surrounding tissue.

Limitations

This study was conducted on swine colon mucosa which is anatomically different in colonic tissue thickness and metabolism. New hemorrhoid therapy devices need to be studied on human colon tissue in order to determine their efficacy and safety.

Further studies need to be conducted with human subjects to determine the benefits of the HET treatment modality versus conservative therapy.

References

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