Arthroscopic Subacromial Decompression

A Shoulder Series Technique Guide
As described by:
Roy Majors, MD
Arthroscopic Subacromial Decompression Using the DYONICS° BONECUTTER° ELECTROBLADE° Resector

Introduction

Most surgeons change instruments several times throughout the course of a subacromial decompression procedure. They generally use a blade for soft tissue resection, a burr for bone resection, and an RF device for hemostasis. The DYONICS° BONECUTTER ELECTROBLADE Resector eliminates the need for more than one resection device, as it resects soft tissue and bone with simultaneous coagulation of bleeding vessels.

The resector’s unique design combines the soft tissue resection properties of a DYONICS 4.5 or 5.5 mm Full Radius Blade with the coagulation capabilities of a bipolar radiofrequency (RF) probe (Figure 1).

Proprietary SURILLIUM° Coating on the inner blade maintains blade durability and cutting efficiency. Insulation on the outer blade isolates the electrical energy to the inner blade’s cutting window where it is exposed to tissue. The 5.5 mm blade is designed to efficiently clear debris from the joint. The 4.5 mm blade facilitates easier access to the joint and serves as an optimal tool for smaller decompression cases.

The resector operates with a standard DYONICS POWER, POWERMAX° or POWERMAX ELITE Shaver Handpiece. A Smith & Nephew VULCAN° Generator or ERBE Generator is required to deliver RF energy.

A reusable adaptor enables coagulation with the VULCAN Generator (Figure 2). It incorporates a 2-pin plug which accepts the resector and an 8-pin connector to attach to the VULCAN generator.

As described by:
Roy Majors, MD
OrthoCarolina, Charlotte, NC
Set Up

Securely attach the reusable VULCAN™ Adaptor to the side of the generator. Insert its tab into the notch on the side of the generator and clip the bracket over the top to snap it in place (Figure 3). Once connected, the adaptor may remain on the generator.

Attach the 8-pin connector to the plug on the front of the generator (Figure 4). Connect the footswitch to the plug on the rear of the generator.

Turn the generator on. Verify that software version 3.60, 3.60S2, or 3.71 displays on the front LED panel (Figure 5) during system start-up. The resector will not function properly with other software versions.

Connect the resector to the DYONICS® POWER®, POWERMAX® or POWERMAX ELITE Shaver Handpiece. To expose the active inner blade to tissue for coagulation and ensure that there is adequate fluid flow through the handpiece, set the blade window 3/4 closed using one of these options:

- Depress and hold the DYONICS POWER Control Unit SLOWER and FASTER buttons at the same time.
- Depress and hold the WINDOW LOCK button on the footswitch.
- If using a hand-controlled handpiece, depress and hold the OSCILLATE button (Figure 6).

Insert the resector’s blue 2-pin cable into the plug on the VULCAN Adaptor (Figure 7). The generator’s COAG setting will default to 100 watts. The maximum COAG setting is 140 watts. Use the lowest power setting necessary to achieve hemostasis.
Patient Preparation

Position the patient, establish portals, and perform a glenohumeral arthroscopy per standard protocol for subacromial decompression. It is extremely important to get the shoulder exposed when positioning the patient. Be careful not to place drapes too close to the surgical field. When a 5.5 mm BONECUTTER® ELECTROBLADE® Resector is used, distraction of the shoulder may facilitate access to the joint.

Technique

When using the 5.5 mm BONECUTTER ELECTROBLADE Resector, the cannula diameter must be at least 7 mm. When using the 4.5 mm BONECUTTER ELECTROBLADE Resector a 5.5 mm cannula may be used. Insert the resector into the subacromial space through a standard portal or cannula just as for any other shaver blade or radiofrequency device. (Figure 8)
Operating the shaver in oscillate mode, resect the synovial and bursal tissue, medially from the anterior to posterior aspects, to enable adequate visualization of the acromion, rotator cuff, and bursa. Keep the blade oriented toward the acromion, in order to avoid damage of the rotator cuff (Figure 9).

In areas where small bleeding vessels may be encountered, such as the posterior region of the bursa, frequent use of coagulation in conjunction with shaving is recommended to help maintain a clear field of view (Figure 10).

Utilizing coagulation while mechanically resecting tissue may avoid char-like build-up on the tissue at the end of the case. This is achieved by depressing the generator’s COAG pedal while simultaneously operating the handpiece using foot or hand controls.

When resecting the highly vascular tissue on the inferior side of the acromioclavicular joint (Figure 11), apply RF energy continuously in order to control bleeding from the acromial branch of the thoracoacromial artery.

With the handpiece in Forward mode, peel the periosteum off the acromion. Move from the mid-coronal line at the clavicle's posterior border to the anterior tip, then progress from the far medial aspect to the far lateral aspect (Figure 12). Resection is most efficient when coagulation is used simultaneously with tissue removal.

Some surgeons may prefer to remove the coracoacromial ligament at this point of the procedure (Figure 13). However, it may be beneficial to resect it at a later time as it serves as a landmark and can prevent less soft tissue extravasation of fluid.
Acromioclavicular (AC) Joint Resection

To resect bursal bands, pinch them up under the acromion and cauterize as bleeding is encountered. Run the resector in one direction to clean up the ends of the bursal bands (Figure 14). When resecting the distal clavicle, it is essential to exercise caution when using RF.

CAUTION: Discontinue cautery use when resecting tissue in superficial areas of the AC joint (Figure 15).

It is easy to burn the skin, as there is no protective muscle in this area. If a bleeder is encountered, use spot coagulation as needed. Push down the clavicle with fingers to facilitate resection of the tip of the clavicle.

If situations arise where only coagulation is needed, stop the resector and activate and apply RF energy to the bleeding site until hemostasis occurs. The WINDOW LOCK function may be used to partially open the resector to generate greater suction, or to close the resector to establish greater contact.

WARNING: Ensure that there is uninterrupted flow of irrigant through the resector to maintain safe fluid temperature in the joint space.

Acromioplasty

For the acromioplasty, operate the resector in forward mode with the suction lumen fully open. Increasing speed to 8000 rpm will allow brisk bone resection. Begin at the acromion's anterolateral corner and progress medially to the level of the AC joint (Figure 16). Next, remove the lateral bone to enable medial access. Resection proceeds in a cutting block manner using a sweeping motion from anterior to posterior, taking care to avoid creating a concave or spoon-shaped acromion. Leaving the periosteum intact is essential and allows measurement of the resection depth.

Once the acromioplasty is complete, perform a full resection of the coracoacromial ligament. Detach the ligament from the coracoid, and debride the remaining portion off the anterior acromion (Figure 17).

Coagulate any remaining bleeding vessels. If a rotator cuff repair is necessary, use the resector to prepare the greater tuberosity and the tendon edges and control any additional bleeding.

WARNING: Ensure that there is uninterrupted flow of irrigant through the resector to maintain safe fluid temperature in the joint space.

Additional Instruction

Prior to performing this technique, consult the Instructions for Use documentation provided with individual components – including indications, contraindications, warnings, cautions, and instructions.
Tips and Pearls

- During RF activation, use arthroscopic visualization to ensure that suction is on and the resector tip and the uninsulated tube return are completely surrounded by irrigant solution.

  **WARNING:** Ensure that there is uninterrupted flow of irrigant through the resector to maintain safe fluid temperature in the joint space.

- Although the maximum setting for the BONECUTTER™ ELECTROBLADE™ Resector is 140 watts, the surgeon should use the lowest possible power setting to achieve the desired coagulation effect.

  **WARNING:** If the surgeon increases the power settings, the surgeon should also increase the irrigant flow through the joint to maintain a safe fluid temperature.

- There is a learning curve associated with the BONECUTTER ELECTROBLADE Resector and most surgeons need to use this device several times to become comfortable with the simultaneous resection and coagulation. It is recommended that the surgeon trial this device a minimum of three to five times.

Ordering Information

Some of the more common instruments for shoulder repair are listed below. Call +1 800 343 5717 in the U.S. or contact your authorized Smith & Nephew representative to order any of the following components.

<table>
<thead>
<tr>
<th>REF</th>
<th>Description</th>
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<tr>
<td>7205962</td>
<td>DYONICS™ BONECUTTER ELECTROBLADE Resector 5.5 mm; packaged sterile; single use; 3 per box.</td>
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<tr>
<td>72202213</td>
<td>DYONICS BONECUTTER ELECTROBLADE Resector 4.5 mm; packaged sterile; single use; 3 per box.</td>
</tr>
<tr>
<td>7210380</td>
<td>ELECTROBLADE Adaptor (required to operate 7205962 and 72202213); packaged non-sterile, reusable.</td>
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**CAUTION:** U.S. Federal law restricts this device to sale by or on the order of a physician.

Courtesy of Smith & Nephew, Inc., Endoscopy Division

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