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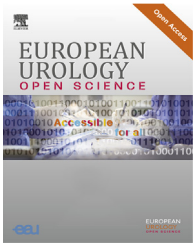

European Association of Urology

Open to Debate – Referee

Is the Choice Between Clips and No Clips or Cautery and No Cautery Still a Dilemma in Robot-assisted Radical Prostatectomy?

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In the two papers in this Open to Debate series, de la Taille [1] defends the position that a clipless technique during robot-assisted radical prostatectomy—using low-energy bipolar coagulation of short duration—is feasible and reproducible, yielding similar outcomes (continence and potency recovery) to those achieved with the "standard" approach (clips and no energy) that is advocated by Zhu et al. [2].

Theoretically, damage to the unmyelinated nervous fibers of the neurovascular bundles can be direct (mechanical or thermal) or indirect (traction, inflammation, fibrosis). Clips avoid thermal damage, but their precise positioning depends on the table assistant. Clip compression of tissue extends to at least 2 mm, and clips may provoke a local reaction, such as moderate mucosal inflammation with granulation tissue [3] and consequent formation of adhesions [4], and they can migrate at the level of the bladder neck and vesicourethral anastomosis [5]. Successful use of energy (monopolar or bipolar cautery, ultrasonic shears) is related not only to proper positioning but also to the duration, power, and type of energy delivered. Pinpoint low energy ($\leq$30 W) of short duration (<1 s), preferably bipolar, is the commonly agreed indication.

The maxim to "avoid energy and use clips", the so-called "standard" technique, is mainly based on one paper from Johns Hopkins Medical Institutions [6]. The paper refers to an elegant and well-designed canine study in which 12 dogs were divided into four groups (three dogs per group) undergoing unilateral nerve-sparing surgery using ligatures, monopolar cautery, bipolar cautery, or ultrasonic shears. Postoperative evaluation was based on measurement of intracavernous pressure after electrical stimulation of the cavernous nerves in the untouched bundle and the bundle operated on. Both immediately after surgery and at 2 wk, there was a clear advantage with ligatures in comparison to the use of thermal energy. How can this result be transferred to real life, in which many other variables may impact the outcome of interest, such as age, local hematoma, inflammation, fibrosis, neural regeneration over time, motivation, rehabilitation, surgeon expertise, and follow-up time, just to mention a few?

What is the scientific basis for the use of different energies? Hefermehl et al. [7] analyzed the impact of different energies on a model involving strips of fresh bovine muscle fascia, and the results give clear messages regarding the depth of thermal damage in various settings. Again, how can these data be transferred to real life? The neurovascular bundle structure is very far from the fascia, and many factors are not taken into consideration (tissue impedance, local temperature, CO_2 atmosphere).Of note, some studies have examined the efficacy of clipping in thoracic sympathectomy in animals, highlighting the fact that clips can provoke neural damage [8] involving fibrinous material and polymorphonuclear leukocyte infiltration with fat necrosis [9] that prevents impulse conduction.

Surgical "standards" are often based on concepts founded on traditions, hypotheses, and beliefs with a debatable sci-

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entific basis. Several cognitive biases also play a role, including framing, representative, confirmation, and anchoring biases. This intrinsic weakness of surgical knowledge could be explained by the fact that in any surgical procedure there are so many interconnected variables—surgical and nonsurgical—that it is challenging to extrapolate a single factor.

In our personal practice, we have been and are advocates of pinpoint low-energy monopolar cautery of short duration [10]. A careful review of the literature regarding the experiences of others reveals starting points on one hand of the difficult treatment of some cases in which Hem-o-Lok clips can migrate at the level of the vesicourethral anastomosis [5], and on the other the observation of a young patient regaining erectile function in 2–3 wk despite the use of cautery. Clearly, this case is anecdotal and an enlightening example of the importance of evidence-based practice. However, emerging clinical data show similar outcomes with different techniques, as cited by de la Taille [1] and Zhu et al. [2].

The ideal strategy would be to design prospective randomized or comparative studies with the main objective of showing whether energy use is detrimental in comparison to thermal clip procedures. Unfortunately, there are an overwhelming number of confounding variables. Such studies are challenging to design and conclusions can be biased. A more feasible option would be studies in animal models using modern robotic techniques with or without clips, and the study by Hefermehl et al. [7] paves the way to such an approach.

In conclusion, the debate is open and no verdict can be delivered. Meanwhile, practice should be based on continuous scrupulous and honest evaluation of personal outcomes.

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