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## RABBIT OVARIECTOMY WITH AIRPLASMA TECHNOLOGY

*Giuseppe Bonaffini, Luca Scandone, Chiara Ottino, Elena Colombino, Matteo Serpieri, Ilaria Prandi, Giuseppe Quaranta, Mitsy Mauthe von Degerfeld*

Università degli Studi di Torino, Dipartimento di Scienze Veterinarie (DSV), CANC (Centro Animali Non Convenzionali).  
Corresponding author: G. Bonaffini (giuseppe.bonaffini@unito.it)

Onemytis® is an electro-thermo-clotting-ablation device which employs Airplasma technology. It adopts the gas ionization principle, in which a high voltage electromagnetic field ionises a neutral gas (air). The originated energy (plasma energy) is seen as a “flare” that is only visible, and working, when there is not direct contact between the tissue and the handpiece. The flare is extremely thin (smaller than a cold blade) and develops a medium temperature of 50°C [1, 2]. The aim of this study is to evaluate, from a clinical and surgical point of view, the efficacy of Onemytis® during rabbit ovariectomy, comparing this device with an electrosurgical one (AM 308-N) and with scalpel blade.

The research has been approved by Bio-Ethical Commission of DSV with protocol number 568 on 23/02/2022.

The study was performed on 27 client-owned female rabbits admitted to CANC, a unit of the DSV (University of Turin). Their age ranged between 4 months and 4 years, and they belonged to different breeds. Ovariectomy followed standard procedures and was performed by a surgical veterinary team made up of two surgeons (one of them with expertise in the use of the device) and an anaesthetist. Animals were randomly divided in two groups: in one group Onemytis® was employed for skin incision (Group 1), while in the other it was cut through scalpel blade (Group 2). In each rabbit one ovary was removed through Onemytis®, while the electrosurgical device was employed to excise the other. The intensity of both electrical units was set according to surgeons' previous experience: AM 308-N was regulated at the power usually set for normal use (45kW) while Onemytis® was used at maximum intensity. Both surgeons carried out an equal number of surgeries with both instruments and as lead surgeon (L) and assistant (A). A form to fill out was devised to evaluate the functioning of Onemytis® device. The anaesthetist completed it during surgery while both surgeons filled it in after the operation, without sharing opinions with the colleagues. The surgical wound was monitored through a blind study: a fourth veterinarian, who did not know the devices employed on each animal, checked the wound after 1 (T1) and 8 (T8) days post-surgery and filled out another form. Results were submitted to statistical analysis by Student's t-test.

Veterinarians' evaluations pointed out that, as expected, scalpel blade was more fluent in skin incision than plasma device thanks to its lower resistance ( $p=0.012$ ) and caused less tissue damage ( $p=0.002$ ). Onemytis® encountered less resistance in ovarian excision than electrosurgical device ( $p=0.001$ ) and, even at maximum power, produced less damage in the surrounding tissues ( $p=0.025$ ). The evaluation of all other parameters (haemorrhage and homogeneity of cutting edges) did not stress any difference in the employment of Onemytis® and cold blade in skin incision or of plasma and electrosurgical devices in ovarian excision ( $p>0.050$ ). Both L and A, despite their different role during surgery, expressed similar assessments on the use of the tested devices ( $p>0.050$ ). During surgery, electrocardiographic signal was lost while activating both Onemytis® and AM 308-N and reappeared when their power was turned off. Since cutting with plasma device is faster (due to the less cutting resistance), ECG absence was shorter, allowing a more precise monitoring of the patient. Monitoring of the surgical wound (on T1 and T8) did not highlight any significant difference in the healing process of wounds performed through plasma or scalpel blade. Only tissue warmth was higher on T8 in wounds provoked by Onemytis® device ( $p=0.010$ ). Results highlight the effectiveness and safety of Onemytis® system. Compared to electrosurgical units, it is faster, more fluent and causes less tissue damage. During surgeries it allows a clean incision, with good bleeding control, and does not alter healing times, even if employed by a surgeon inexperienced in its functioning.

[1] Mc Donald J. et al. Comparison of the effects of surgical dissection devices on the rabbit liver. *Surg Today* 2014; 44:1116–1122.

[2] Laticignola L, et al. Comparative morphological effects of cold-blade, electrosurgical, and plasma scalpels on dog skin. *Vet Sci.* 2020; 7(1):8-10.