Tape and cyanoacrylate versus intradermal suture for celiotomy skin closure in dogs: a biomechanical study

Kitshoff A.[*], Koenraadt A.[*], Or M.[*], Devriendt N.[*], Dehuisser V.[*], Louwagie J.[†], de Rooster H.[*]

[*]Small Animal Department, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium
[†]Centre for Textile Science and Engineering, Ghent University, Technologiepark-Zwijnaarde 70A, 9052 Gent, Belgium

The use of self-adhering polyester mesh combined with 2-octyl cyanoacrylate (MOC) has been reported in human medicine for closure of skin wounds. The objective of this study was to compare the tensile strength at 14 and 28 days postoperatively. Additionally, the time of application between MOC and an intradermal suture pattern (ISP) was studied. A skin incision was created from xiphoid to pubis in 12 experimental dogs to perform a standard ovariohysterectomy, and the linea alba and subcutaneous tissue were closed routinely. Half of the skin incision was closed with MOC and the other half with an ISP. Biopsies were taken from both sections at 14 and 28 days for mechanical testing. The MOC was significantly faster from start to completion when compared to the ISP with a mean of 73 ± 14 seconds and 398 ±36 seconds, respectively (P = .002). The load to failure and tensile strength increased significantly with time for the MOC (P = .006; P = .004) and ISP (P = .002; P = .002). At day 14, the load to failure and tensile strength was significantly higher in dogs treated with MOC when compared to ISP (P = .007; P =.014). However, at 28 days postoperatively, wounds were no longer significantly different between closure techniques (P = .068; P = .101). Mesh and cyanoacrylate offers an alternative to intradermal sutures for coeliotomy surgical skin incisions, especially in patients where surgical/anesthetic time is of concern. The tensile strength of wounds closed with MOC is significantly more compared to wounds closed by an ISP at 14 days postoperatively.