

VICRYL RAPIDE FOR SKIN WOUND APPROXIMATION IN DOGS

Somil Rai¹ and V.P. Chandrapuria²

¹PhD Scholar, ²Professor & Head, Department of Veterinary Surgery & Radiology,
College of Veterinary Science and A.H., N.D.V.S.U., Jabalpur (M.P.)

[Received: 13.10.2014; Accepted: 30.4.2015]

The study conducted for selection of appropriate suture material to achieve better results in healing of skin wound. Polyglactin 910 (Vicryl rapide) was used for approximation of skin edges following various surgical procedures in canines. The tensile strength, handling characteristics, knotting capacity and postoperative parameters were assessed for Vicryl rapide as external suture material. The dogs where wounds were sutured with Vicryl rapide, the threads only have to be wiped away, or had already fallen off by themselves. Good tolerance and the fact that there is no need to remove stitches make Vicryl rapide suture very interesting for veterinary practice especially in canine surgery.

Introduction

A suture is defined as a biomaterial device, natural or synthetic, used to approximate tissues following separation by surgery or trauma and search for new and improved suture materials is still continue (Goldenberg, 1959). Suture materials should produce minimal tissue reaction (Varma *et al.*, 1981), primary wound healing, good cosmetic results and avoidance of scarring. The wound healing process can also be affected by the type and amount of suture material used, the suture pattern, the suturing technique, and the amount of tension on the suture. To date, none of the suture possesses all ideal properties (Fossum, 2013). The absorbable sutures lose their tensile strength in less than 60 days (Boothe, 1985). Although non-absorbable monofilament suture materials present advantages with regard to their tensile strength, resistance to contamination and biocompatibility with living tissues but they are difficult to handle, especially during suturing and knotting, because of their rigidity and risk of sinus formation (Peacock, 1984). Absorbable sutures made from animal derivatives such as gut and chromic gut does not require removal but as these material digest, their by-products may result in wound inflammation. The polyglycolic, polylactic acid polymer-derived sutures are absorbed by enzymatic

degradation by hydrolysis, resulting in less inflammation. These sutures are well suited for deeper layer, non-surface closure but if used on the surface, they remain for at least four to six weeks, accumulating debris at the wound site and often necessitating manual removal. Irradiated polyglactin 910 (IRPG) Vicryl Rapide (Ethicon, Somerville, N.J.) is a braided co-polymer of glycolic and lactic acid that is surface treated with polyglactin 370 and calcium stearate and has received gamma radiation. This radiation alters the suture material's molecular structure and enhances its absorption rate in vivo. (Knote and Bohmert, 1996, Moy *et al.*, 1991)

Materials and methods

The experiment was performed on 12 clinical cases of dogs, irrespective of age, sex and breed presented for various surgical interventions. In all the cases, skin wound edges were approximated with Polyglactin 910 (Vicryl rapide, Ethicon) synthetic rapid absorbable suture by simple interrupted suture..

Parameters of study:

1. The tensile strength, handling characteristics were observed and evaluated as Square knot positioning and resistance of knot slippage. The characteristic was rated on an arbitrary scale of poor, fair, good and excellent.

2. Evidence of postoperative swelling, signs of licking and irritation, signs of local inflammation, exudation and wound

dehiscence were observed and recorded on 3, 5, 9 and 11 days postoperatively.

Fig. 1 Vicryl rapide



Fig. 2 Skin suturing with Vicryl rapide



Results and discussion

The total twelve clinical cases of ventral midline laparotomy were subjected for the skin wound approximation with Polyglactin 910 (Vicryl rapide). In all the

cases the skin wound approximation was performed by the simple interrupted suture pattern with surgeons knot. The tensile strength was found to be good during all the cases of the study.

Table: 1. Intra operative assesment

Parameters	Poor	Good	Excellent
Knotting capacity	-	10	2
Handling	-	-	12

Table: 2. Clinical observations

Parameters	Day 3	Day 5	Day 9	Day 11
Inflammation	++	+	-	-
Discharge	+	-	-	-
Approximation	+++	+++	+++	+++

Table: 3. Post operative observations

Parameters	No. of cases	% incidence
Suture removed	1	08.33%
Suture threads fallen off themselves	11	91.66%

The tables showed the distribution of arbitrary grade for the most significant performance of Vicryl rapide during the various surgical affections in canines. The knotting capacity and handling characteristic for Vicryl rapide were often marked with grades poor to excellent. The knotting capacity for Vicryl rapide was graded as good in ten cases (83.33%) and excellent in two cases (16.66%). The knot positioning with Vicryl rapide has an average grade was also concluded in previous report by Rosin and

Robinson (1989). However the handling was graded as excellent in all the twelve cases of the study. It is clear that the objective of suturing is to place multiple layers of tissues in close contact so that a minimal quantity of new connective tissue will be required to restore structural integrity of the tissue in the shortest possible time. The handling characteristics of surgical sutures are one of the most important considerations in suture selection (Faulkner *et al.*, 1996, Bennett, 1988) as also observed as very good

handling characteristic of Vicryl rapide in the present study.

In the present study polyglactin 910 (Vicryl rapide) was found effective for skin approximation in dogs. No complication was observed and suture material was found to be well tolerated in all the cases (Bennett, 1988). The inflammation noticed on second to fifth day might be due to surgical response of the tissue (Freeman *et al.*, 1970, Moy *et al.*, 1992), which subsided in later phase of the healing in all the animals.

Almost all the sutured wounds showed complete absorption of the suture material inside the skin however the outer part of the material gets dried and sloughed out in all the animals except in one case. In the present study suture removal was not required in eleven cases (91.66%). The results indicate that the Vicryl rapide initiates negligible surgical trauma, perfect healing of sutured wound without any complications (Canarelli *et al.*, 1988, Martelli *et al.*, 1994).

Conclusion

The results obtained with Vicryl rapide sutures were comparable to those of traditional non-absorbable sutures with a good tolerance, as well as the fact that no stitches removal is required, it makes Vicryl rapide a first choice for skin closure in veterinary surgery. However, a sequential study is required for its implementation as external suture.

References

- Bennett, R. (1988). Selection of wound closure materials. *J. Am. Acad. Dermatol.*, **18**: 619- 637.
- Boothe, H.W. (1985). Suture materials and tissue adhesives. In: Textbook of Small Animal Surgery, (Slatter D.H., Ed.). Philadelphia, W. B. Saunders, P p. 334.
- Canarelli, J.P., Ricard, J., Collet, L.M. and Marasse, E. (1988). Use of fast absorption material for skin closure in young children. *Int. Surg.*, **73**: 151-152.
- Faulkner, B.C., Tribble, C.G., Thacker, J.G., Rodeheaver, G.T. and Edlich, R.F. (1996). Knot performance of polypropylene sutures. *J. Biomed. Materials Res.*, **33**: 187-192.
- Fossum, T. W. (2013): Small Animal Surgery. Chapter 8 - Biomaterials, Suturing and Hemostasis. Mosby. St. Louis, (4th Edn) Pp. 64-65.
- Freeman, B.S., Homsy, C.A., Fissette, J. and Hardy, S.B. (1970). An analysis of suture withdrawal stress. *Surg. Gynecol. Obstet.*, **131**: 441-448.
- Goldenberg, I. (1959). Catgut, silk and silver - the story of surgical sutures. *Surgery*, **46**: 908- 912.
- Knote, G. and Bohmert, H. (1996). Prolene and Vicryl as synthetic suture material for the intracutaneous suture technique. *Fortschr. Med.*, **78**: 276-280.
- Martelli, D., Catena, D., Rahon, H., Boukheloua, B., Wilcart, F. and Pellerin, D. (1991). Skin closure in pediatric surgery. *Presee Med.*, **20**: 2194-2198.
- Moy, R. L., Lee, A. and Zalka, A. (1991). Commonly used suture materials in skin surgery. *A.F.P.*, **44**: 2123-2128.
- Moy, R.L., Waldman, B. and Hein, D.W. (1992). A review of sutures and suturing techniques. *Dermatol. Surg. Oncol.*, **18**: 785-795.
- Peacock, E. E. (1984). Wound Repair. 3rd ed. WB Saunders, Philadelphia, Pp. 148-157.
- Rosin, E. and Robinson, G.M. (1989). Knot security of suture materials. *Vet. Surg.*, **18** (4): 269- 273.
- Varma, S., Ferguson, H.L. and Johnson, L.W. (1981): Tissue reaction to suture materials in infected surgical wounds - a histopathological evaluation. *Am. J. Vet. Res.*, **42**: 563-569.