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Effect of polyglactin and polypropylene suture materials on the healing of induced pericardial injury in dogs

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Abstract

The article was planned to recognize the effect of polyglactin and polypropylene sutures on pericardial healing in dogs. In this study, twelve mature dogs were utilized. The dogs were separated into two groups. In all animals, after induction of general anesthesia and connection with a positive pressure ventilation machine, intercostal thoracotomy between the 6th and 7th intercostal space was dependent. 2cm of surgical incision was established on the pericardium. In group one, the site of the pericardial incision was sutured with 2/0 polyglactin using a simple continuous pattern technique. In contrast, in the group two, the pericardial incision was closed by 2/0 polypropylene using the same suture technique. The gross and histopathological changes on days 7 and 21 post-operation depended on evaluating the difference between the two sutures on the pericardial healing process. The gross results in both groups revealed thickening in the pericardial tissue that appeared untransparent in texture with varying degrees of adhesion formation between the suturing site and surrounding tissues. The histopathological features revealed the formation of new granulation tissue, inflammatory cells, and fibrinous exudate with blood vessel congestion in both groups. The inflammatory reaction in the first group appeared more than in the second group. In conclusion, the suturing of the pericardium with polypropylene is relatively better than polyglactin.

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Introduction

The pericardium is a sac that encloses the heart. It consists of external fibrous and internal serous layers. The serous layer of the pericardium includes a visceral layer called the epicardium, which covers the heart and big vessel roots, and a parietal layer covering the fibrous layer of the pericardium. Between layers, there is a pericardial cavity that contains pericardial fluids (1). The fibrous layer is a dense collagenous tissue, while the serous layer is lined with mesothelial cells that secrete the pericardial fluid (2). The pericardium has several functions, such as a mechanical role to protect the heart and greater vessels, and as a lubricant to decrease the abrasion between surrounding structures and the heart (3). In addition, it prevents the occurrence of heart overfilling, as a barrier to protect the heart from infection, elevation of cardiac efficiency, generation of pericardial fluid, and phospholipid surfactants (4). Like, other tissues, the pericardium may suffer from several affections, such as pericardial effusion (5). Pericardial effusion commonly occurs in dogs due to intrapericardial hemorrhages that result from tumors, idiopathic pericarditis, traumatic causes, and infections (6-9). Constrictive pericarditis may occur (10). Generally, some cardiac surgeons prefer to close the pericardium as much as possible after cardiac surgery, while others prefer to avoid this practice. Pericardial reconstruction to repair the defects may be needed following some surgical operations, such as resections of the lung with partial

pericardiectomy. However, closing the pericardium by suturing or using a substitute may protect the heart from some postoperative complications, such as retrosternal adhesions and injury (4,11,12), in addition to the recompartmentalization of the intrapericardial microenvironment and improvement of cardiac hemodynamics (4). Generally, minor pericardial defects that occur after intrapericardial pneumonectomy or during heart surgery can be closed by suturing. In contrast, medium or large-sized pericardial defects generally require reconstruction or pericardioplasty using synthetic or biological materials (13-16). Polyglactin suture is a synthetic absorbable suture, composed of glycolic and lactic acids in a ratio of 9:1. It is more hydrophobic and more resistant to hydrolysis. The suture is available as a coated suture to improve its handling characteristics. Its monofilament structure, gives it a smooth surface that reduces friction against tissue, minimizes trauma to the tissue, and allows for easy passage through tissue. In addition, it is characterized by slow absorption (17-20). Polypropylene suture is a non-absorbable, monofilament suture. It has the least thrombogenic sutures, less tissue reaction, and significantly accommodates tissue swelling. Therefore, it is frequently used in vascular surgery but is characterized by poor knot security (21). It also closes tissues with high elongation capability, such as skin and cardiac muscles (22-24).

However, the main aim of this study is to investigate the differences between polyglactin as an absorbable suture and polypropylene as non-absorbable suture in the healing process of the pericardium, grossly and histopathological.

Materials and methods

Experimental animals

Twelve mature male dogs, aged 2-3 years and weighing 22±1.8 kg, were utilized. All animals were divided into two main groups. The animals were placed in cages in the Veterinary Medicine College, University of Mosul.

Ethical approve

The work was agreed upon by the Ethics Committee of the Faculty of the Veterinary Medicine College, University of Mosul. No. U.M.VET.2023.005.

Surgical operation

Before anesthesia, atropine sulfate was injected subcutaneously at a dose of 0.04 mg /kg. Then, general anesthesia was applied through intramuscular injection of xylazine (3 mg/kg) and ketamine (10 mg/kg) combination (25,26). All animals were submitted to the machine of positive pressure ventilation to prevent lung collapse (27). Intercostal thoracotomy was dependent on this study to enter the thoracic cavity and reach the pericardium for each animal. The left side of the thoracic cage is surgically prepared to perform the surgical operation. The cutaneous incision was done between the 6th and 7th intercostal space. The incision was continued via the thoracic cage muscles until it reached the pleura. Careful incision with non-sharp scissors was applied to open the pleura and prevent lung injury (28). In all animals, a 2 cm surgical incision was created in the pericardium of the heart (Figure 1). In the first group, the pericardial incision was sutured with (2/0) polyglactin suture (Green HD, China) using a simple continuous suture pattern. In contrast, in the second group, (2/0) polypropylene suture (Braun, Spain) was used to suture the pericardium using the same suture technique (Figure 2). Subsequently, the induced surgical wound was sutured routinely. The experimental animals were injected with penicillin-streptomycin (1ml/10 kg.) (penicillin 200000 I.U. + streptomycin 200 mg/1 ml, Interchemi- Holand) and metalgen (1ml/ day) postoperatively for five days after the operation with daily wound dressing.

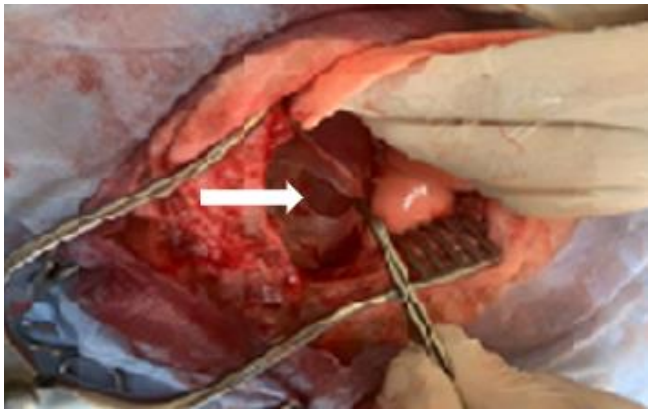

Figure 1: Shows incision of pericardium.

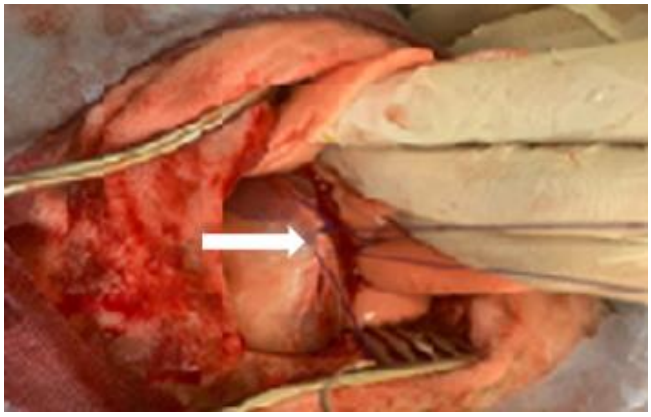

Figure 2: Shows suturing of pericardium.

Assessment of pericardial healing

The macroscopic and microscopic results were studied to evaluate the effects of the two suture materials on the healing process of the pericardium on the 7th and 21st postoperative

days. The animals were not killed during the study period, and a small biopsy was obtained from the site of suturing on each group for histopathological evaluation (28).

Results

Macroscopic results

The gross changes were represented by pounced adhesion formation between the site of pericardial suturing and surrounding tissues such as pleura and the internal wall of the thoracic chest, exactly with the site of operation in both groups on days 7 and 21 postoperatively. In addition, the pericardium became thicker, fibrotic, and non-transparent in both groups (Figures 3 and 4).

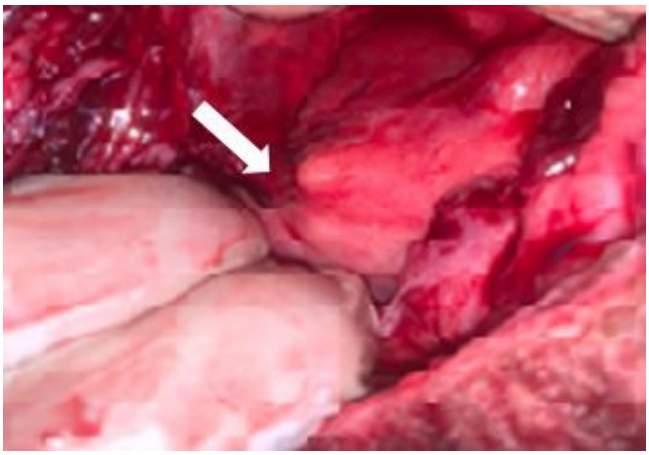

Figure 3: Shows thickening of the pericardium with adhesion formation in the first group.

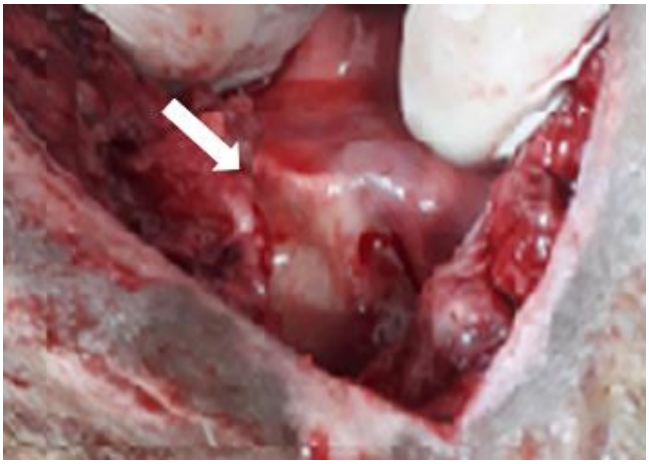

Figure 4: Shows thickening of the pericardium with adhesion formation in the second group**.**

Microscopic results

In the first group, the histopathological results on day 7 post-operation revealed new development of granulation tissue, which formed from new angiogenesis with fibroblast and collagen fibers proliferation. Fibrinous exudate within the collagen fibers of the pericardium, inflammatory cell infiltration, congestion of blood vessels, and thickening in the normal collagen fibers of the pericardium with loss of some areas of the mesothelium were also observed (Figures 5-7). On day 21, after surgical suturing, the results were represented by a severe appearance of granulomatous reaction that's represented by increase in the formation of granulation tissue with infiltration of cells around suture material in this group. The proliferation of mesothelium and thickening of pericardial tissue was also shown (Figures 8-10).

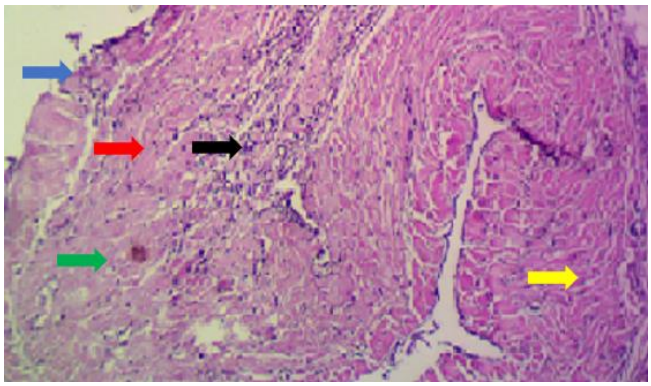

Figure 5: In the micrograph taken on the 7th day in group one, the development of granulation tissue (red color), infiltration of inflammatory cells (black color), thickening of collagen fibers (yellow color), loss of mesothelium (blue color), and fibrin exudate (green color) are visible (H&E, 4X).

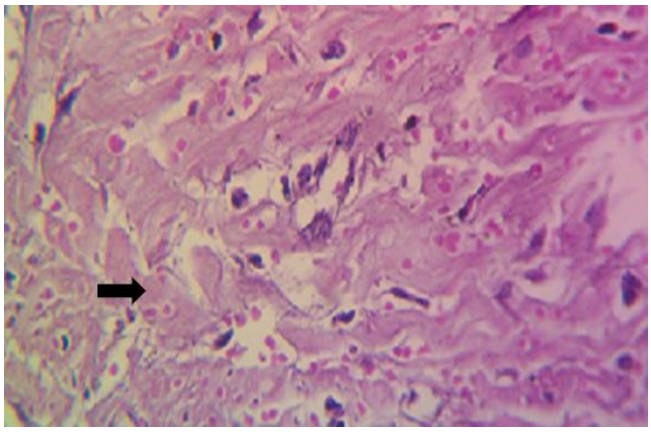

Figure 6: Micrograph on the 7th day in group one showing fibrinous exudate (H&E, 40X).

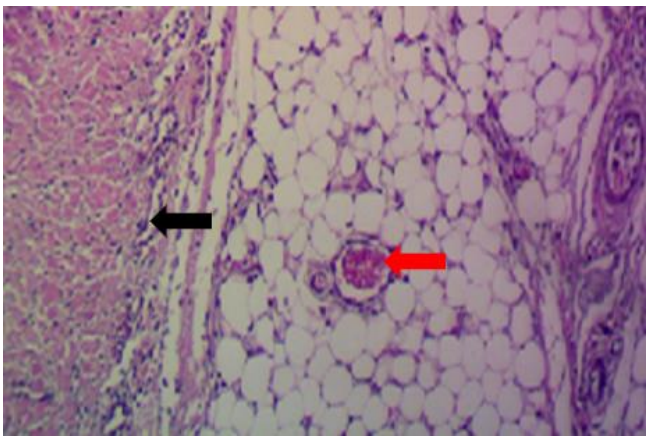

Figure 7: Micrograph on day 7 in group one reveals the presence of inflammatory cells (black color) and congestion of blood vessels (red color) (H&E, 10X).

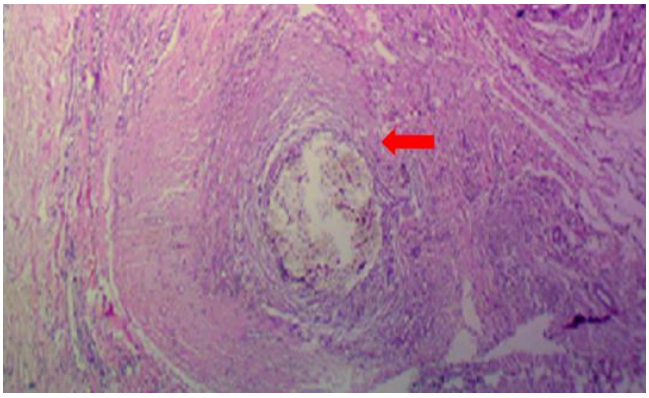

Figure 8: A micrograph taken on the 21st day in group one shows a granulomatous reaction around the suture material (H&E, 4X).

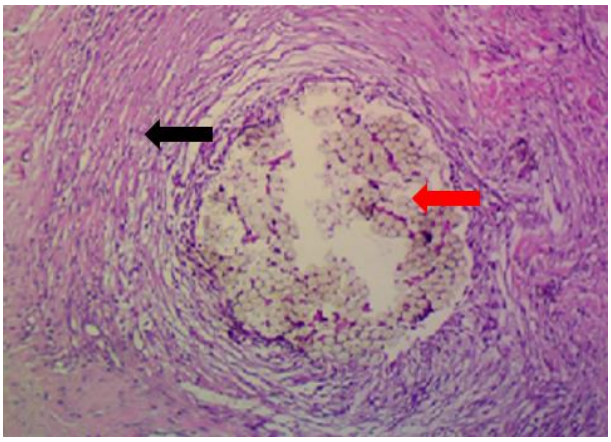

Figure 9: Micrograph on the 21st day in group one shows a granulomatous reaction (black color) around suture material (red color) (H&E, 10X).

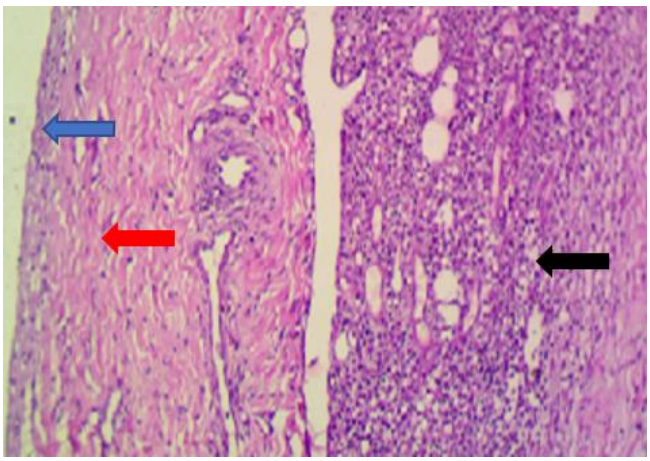

Figure 10: Micrograph on day 21 in group one shows infiltration of inflammatory cells (black color), proliferation of mesothelium (blue color), and thickening pericardial tissue (red color) (H&E, 10X).

In the second group, the microscopic features on the 7th day post-operation were also represented by new granulation tissue formation, thickening in the collagen fibers of the pericardium, loss of some area of the mesothelium, fibrinous exudate within collagen fibers of pericardial tissue and inflammatory cells infiltration (Figures 11-13). On the 21st day post-operation, the histopathological sections revealed an increase in the granulation tissues maturation, and a reduction in the inflammatory cells with more angiogenesis. The proliferation of mesothelium was noticed (Figure 14-16). There are no features of severe granulomatous inflammation.

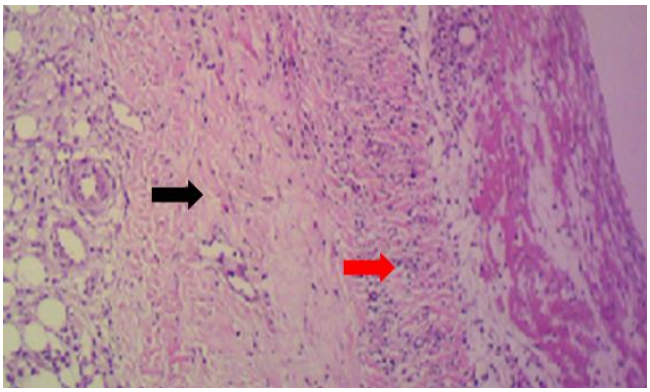

Figure 11: Micrograph on the 7th day of the second group shows new granulation tissue formation (black color) and infiltration of inflammatory cells (red color) (H&E, 10X).

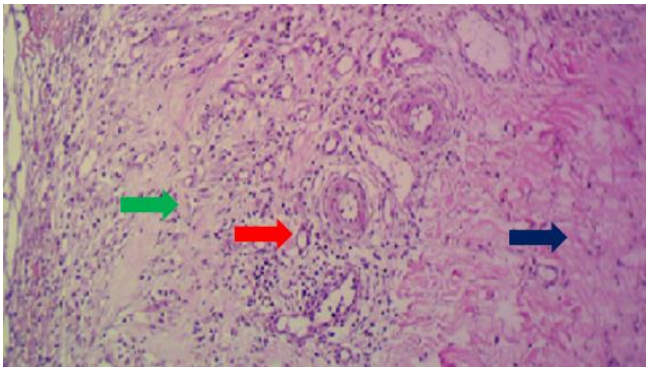

Figure 12: In the micrograph taken on the 7th day in group two, new development of granulation tissue (green color), fibrinous exudate (blue color), and angiogenesis (red color) is evident (H&E, 10X).

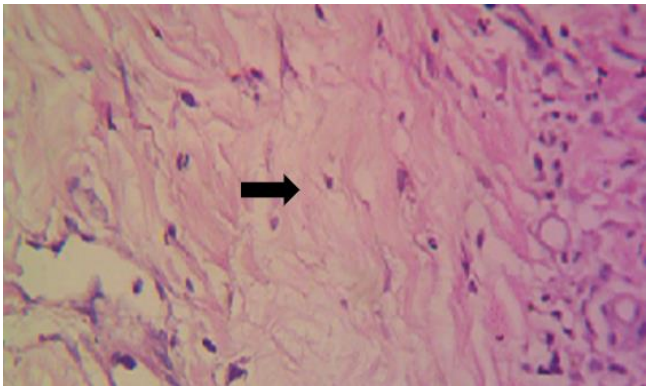

Figure 13: Micrograph on the 7th day in group two shows fibrinous exudate (H&E, 40X).

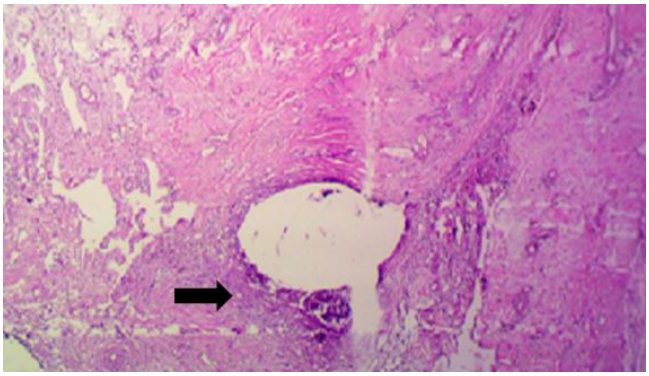

Figure 14: A micrograph taken on the 21st day in group two shows a maturation of granulation tissue formation around suture material (H&E, 4X).

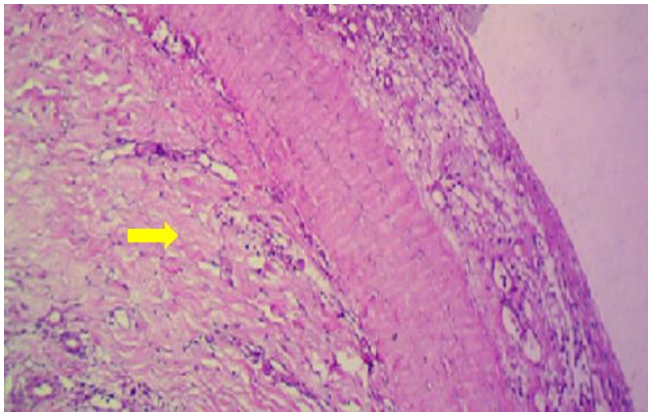

Figure 15: A micrograph taken on day 21 in the group shows the maturation of granulation tissue (H&E, 10X).

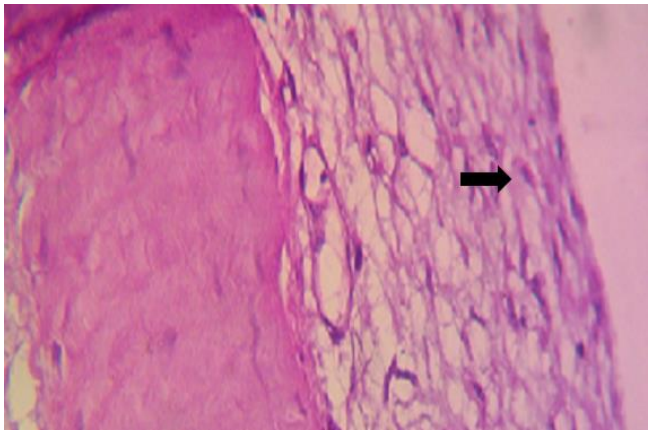

Figure 16: Micrograph at 21st day in group two appears proliferation of mesothelium (H&E, 40X).

Discussion

The main role of suturing is to hold or bind the wound's edges together in apposition until the healing process is sufficiently advanced for the wound to be self-supporting. The mesothelial cells, which coat the serosal layer of the pericardium, play a vital role in pericardial functions such as in inflammation, coagulation, fibrinolysis, and tissue repair (3), where after the occurrence of injury, these cells secrete different proinflammatory and immunomodulatory mediators including, cytokines, growth factors, chemokines, coagulation cascade products, prostaglandins, proteolytic enzymes, reactive oxygen and nitrogen species (29,30). In both groups, loss of mesothelium with fibrinous exudate was noticed, in addition to the inflammatory cell infiltration. These features are due to the secretion of chemokines by mesothelial cells, which permits the migration of inflammatory cells into the serosal space (31). After taking biopsies during pericardiotomy, the degenerative changes start with the alteration of the shape of mesothelial cells from

flat shape to cuboidal, infiltration of leukocytes in sub mesothelial space, mesothelial cells desquamation and exposure of connective tissue to the intense transmigration of leukocytes and fibrin deposition (32). In addition, mesothelial cells have a vital role in resolving inflammation by regulating specific integrin-mediators involving very late antigen expression (33). After 21 days from suturing of the pericardium in both groups, the mesothelial was proliferated the healing process of the pericardium was completed relatively after several days through mesothelial cell proliferation and due to epithelial-to-mesenchymal transition (EMT), which allows transmigration and normalization of naked areas. After returning to the principal structure, the cells will be transformed into a mesothelial-like phenotype (34).

Generally, the regenerative process of the pericardium occurs because of contact inhibition loss, the liberation of some mediators from activated cells, and the repopulation of the exposed basal tissue by cells free-floating in the pericardial fluid. The development of adhesions appeared in this study due to tissue injury during surgery (32). Pericardial adhesions are formed by denudation of the sub-mesothelial layer (35). Therefore, fibrinous material, inflammatory cells, and platelets will be adhered to the denuded surfaces. Also, fibrinous deposition was developed during cardiac surgery due to inadequate fibrinolytic activity of mesothelial cells. Therefore, the mesothelium regeneration and adhesions between pericardial layers at the deposition sites become occupied by connective tissue that blood vessels invade. There are several factors, such as peritoneal infection, pericardial surgical intervention, hemorrhage of the pericardium, loss of mesothelial cells, sub mesothelial layer exposure, profusely of macrophages, and reduced fibrinolytic action of mesothelial cells may lead to chronic inflammation of serosal layers and development of adhesion (36). The thickening of the pericardium appeared in both groups (37), and many of a vital process that occurs during the injury of the pericardium where the mesothelial cells suffered from advanced loss of epithelial phenotype and change into fibroblast-like characteristics which permits them to develop fibrosis and new blood vessels formation in the sub mesothelial area. In addition, TGF-b is considered the main mediator in the transformation of mesothelial cells. It helps the profibrotic processes, including, fibroblast activation, collagen fiber deposition, fibrinolysis process suppression, and new vessel formation. As the sequel of the inflammatory process, the bands of connective tissue developed on the surfaces of the pericardium and covered fibrin accumulation. The persistent connective tissue formation after surgery that plugs the pericardial space may lead to the formation of adhesion of the pericardium (35). Also showed that during cardiac surgery or the occurrence of infection, the physiological equilibrium between the creation and drainage fluid was upset and led to the development of pericardial effusion. The presence of inflammation that leads to the congestion of vessels with fibrin deposition and the formation of connective tissue on the parietal layer of the pericardium may cause a mess of the lymphatic drainage and formation of a state of imbalance (35).

Generally, several kinds of suture materials are used to close tissues (38). Using synthetic absorbable and non-absorbable suture materials with good characteristics is essential, especially sutures with less or no biological reaction (39). In this study, relatively polypropylene did not lead to severe tissue reactions than polyglactin, the suture material used in cardiovascular surgery should have some properties such as no or less capillarity, inert and tiniest thrombogenic properties (40). Also showed that surgeons of the cardiovascular systems had always been reluctant to use polypropylene, while others found no significant differences between polypropylene and other absorbable suture materials (41,42).

Conclusion

It is concluded that polypropylene suture is better than polyglactin suture foe closing the pericardium after opening it during heart surgery, and polypropylene doesn't cause the severe tissue reaction caused by polyglactin.

Acknowledgments

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Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this paper

References

1. Khandaker MH, Espinosa RE, Nishimura RA. Pericardial disease: diagnosis and management. Mayo Clin Proc. 2010;85(6):572–593. DOI: 10.4065/mcp.2010.0046
2. Jennings R, Premanandan CH. Veterinary histology. USA: Ohio State University; 2017. [available at]
3. Jaworska-Wilczynska M, Trzaskoma P, Szczepankiewicz AA, Hryniewiecki T. Pericardium: Structure and function in health and disease. Folia Histochem. 2016;54(3):121–125. DOI: 10.5603/FHC.a2016.0014
4. Boyd WD, Tyberg JV, Cox JL. A review of the current status of pericardial closure following cardiac surgery. Expert Rev Cardiovasc. 2012;10(9):1109-1118. DOI: 10.1586/erc.12.87
5. Reed JR. Pericardial diseases. In: Fox PR, editor. Canine and feline cardiology. USA: Churchill Livingstone; 1988. 495-518 pp. [available at]
6. Shaw SP, Rush EJ. Canine pericardial effusion: pathophysiology and cause. Compend Contin Educ Vet. 2007;29(7):400-403. [available at]
7. Lorell BH, Braunwald E. Pericardial diseases. In: Braunwald E, editor. Heart diseases. A textbook of cardiovascular medicine. 4th ed. USA: WB Saunders; 1992. 465-1516 pp. [available at]
8. Sisson D, Thomas WP. Pericardial disease and cardiac tumors. In: Fox PR, Sisson D, Moise NS, editors. Textbook of Canine and Feline

Cardiology. 2nd ed. USA: WB Saunders; 1999. 679-701 pp. [available at]
9. Sugarbaker DJ, Jaklitsch MT, Bueno R, Richards W, Lukanich J, Mentzer SJ, Colson Y, Linden P, Chang M, Capalbo L, Oldread E, Neragi-Miandoab S, Wanson SJ, Zellos LS. Prevention, early detection, and management of complications after 328 consecutive extrapleural pneumonectomies. J Thorac Cardiovasc Surg. 2004;128(1):138-46. DOI: 10.1016/j.jtcvs.2004.02.021
10. Wright KN, DeNovo RC, Patton CS, Sackman JE, Wilkens RE, Gompf RE. Effusive consitrictive pericardial disease secondary to osseous metaplasia of the pericardium in a dog. J Am Vet Med Assoc. 1996;209(12):2091-2095. [available at]
11. Shimizu J, Ishida Y, Hirano Y, Tatsuzawa Y, Kawaura Y, Nozawa A, Yamada K, Oda M. Cardiac herniation following intrapericardial pneumonectomy with partial pericardiectomy for advanced lung cancer. Ann Thorac Cardiovasc Surg. 2003;9(1):68-72. [available at]
12. Bittar MN, Barnard JB, Khasati N, Richardson S. Should the pericardium be closed in patients undergoing cardiac surgery?. Interact Cardiovasc Thorac Surg. 2005;4(2):151–155. DOI: 10.1510/icvts.2004.100388
13. Schummer W. Cardiac herniation with torsion after right pneumonectomy. Indian J Crit Care Med. 2017;21(7):473-474. DOI: 10.4103/ijccm.IJCCM_60_17
14. Veronesi G, Spaggiari L, Solli PG, Pastorino U. Cardiac dislocation after extended pneumonectomy with pericardioplasty. Eur J Cardiothorac Surg. 2001;19(1):89-91. DOI: 10.1016/s1010-7940(00)00612-6
15. Gatzoulis MA, Munk MD, Merchant N, Van-Arsdell GS, McCrindle BW, Webb GD. Isolated congenital absence of the pericardium: Clinical presentation, diagnosis, and management. Ann Thorac Surg. 2000;69(4):1209-15. DOI: 10.1016/s0003-4975(99)01552-0
16. Lazarou G, Powers K, Pena C, Bruck L, Mikhail MS. Inflammatory reaction following bovine pericardium graft augmentation for posterior vaginal wall defect repair. Int Urogynecol J Pelvic Floor Dysfunct. 2005;16(3):242-4. DOI: 10.1007/s00192-004-1230-0
17. Bellenger CR. The purpose of suture and available suture materials. Compend Contin Educ Pract Vet. 1982;4:507. [available at]
18. Boume RB, Biater H, Andreae PR, Martin LM, Finlay JB, Marques F. In vivo comparison of four absorbable sutures: Vicryl, dexon plus, maxon and PDS. Can J Surg. 1988;31(1):43-45. [available at]
19. Devi CV, Ray R, Koduri S, Moharana AK. Clinical equivalence of polyglycolic acid suture and polyglactin 910 suture for subcutaneous tissue closure after cesarean delivery: A single-blind randomized study. 2023;16:27-36. DOI: 10.2147/MDER.s385988
20. Stone IK. Mechanical properties of coated absorbable multifilament suture materials. Obestet Gynecol. 1986;67(5):737-747. DOI: 10.1097/00006250-198605000-00025
21. Al-Hyani OH, Al-Jobory AK, Al-Hasan AM. Effect of different suture materials on healing of blood vessels in dogs. Iraqi J Vet Sci. 2012;26(3):77-82. DOI: 10.33899/ijvs.2012.168742
22. Polykandriotis E, Daenike J, Bolat A, Gruner J, Schubert DW, Horch RE. Individualized wound closure—mechanical properties of suture materials. J Pers Med. 2022;12(7):1041. DOI: 10.3390/jpm12071041
23. Holt GR, Holt JE. Suture materials and techniques. Ear Nose Thrroat J. 1981;60(1):23. [available at]
24. Sharp WV. Sutures resistance to infection. Surgery. 1982;91(1):61-63. [available at]
25. Schwieger M, Szlam F, Hug C. The pharmacokinetics and pharmacodynamics of ketamine in dogs anesthetized with enflurane. J Pharmacokinet Biopharm. 1991;19(2):145-156. DOI: 10.1007/BF01073866
26. Raffea NM, Allawi AH. Effect of autologous peritoneum and platelet rich fibrin graft on healing of intestinal anastomosis in dogs. Iraqi J Vet Sci. 2022;36(2):459- 470. DOI: 10.33899/ijvs.2021.130529.1840
27. Bader OA, Essa MJ. Effect of nano-magnesium oxide and harmonic scalpel on lung lobectomy healing in dogs: Clinical and cytokine study. Iraqi J Vet Sci. 2021;35(4):649-656. DOI: 10.33899/ijvs.2021.127611.1514
28. Al-Jameel WH, Al-Sabaawy HB, Abed FM and Al-Mahmood SS. Immunohistochemical expression of proliferation markers in canine osteosarcoma. Iraqi J Vet Sci. 2022;36(4):1097-1102. DOI: 10.33899/ijvs.2022.133138.2177
29. Mutsaers SE. Mesothelial cells: Their structure, function, and role in serosal repair. Respirol. 2002;7(3):171–191. DOI: 10.1046/j.1440-1843.2002.00404
30. Hellebrekers BW, Kooistra T. Pathogenesis of postoperative adhesion formation. Br J Surg. 2011;98(11):1503–1516. DOI: 10.1002/bjs.7657
31. Wilshaw SP, Burke D, Fisher J. Investigation of the antiadhesive properties of human mesothelial cells cultured in vitro on implantable surgical materials. J Biomed Mater Res B Appl Biomater. 2009;88(1):49–60. DOI: 10.1002/jbm.b.31148
32. Nkere UU, Whawell SA, Sarra CE. Perioperative histologic and ultrastructural changes in the pericardium and adhesions. Ann Thorac Surg. 1994;58(2):437–444. DOI: 10.1016/0003-4975(94)92224-1
33. Mutsaers SE, Birnie K, Lansley S. Mesothelial cells in tissue repair and fibrosis. Front Pharmacol. 2015;9:6–113. DOI: 10.3389/fphar.2015.00113
34. Foley-Comer AJ, Herrick SE. Evidence for incorporation of free-floating mesothelial cells as a mechanism of serosal healing. J Cell Sci. 2002;115(7):1383-1389. DOI: 10.1242/jcs.115.7.1383
35. Cannata A, Cannata A, Petrella D. Postsurgical intrapericardial adhesions: Mechanisms of formation and prevention. Ann Thorac Surg. 2013;95(5):1818–1826. DOI: 10.1016/j.athoracsur.2012.11.020
36. Lai KN, Leung JC. Inflammation in peritoneal dialysis. Nephron Clin Pract. 2010;116(1):11–18. DOI: 10.1159/000314544
37. Germani A, Foglio E, Capogrossi MC. Generation of cardiac progenitor cells through epicardial to mesenchymal transition. J Mol Med. 2015;93(7):735–748. DOI: 10.1007/s00109-015-1290-2
38. Spotnitz WD, Falstrom JK, Rodeheaver GT. The role of suture threads and fibrin sealant in wound healing. Surg Clin North Am. 1997;77(3):651–669. DOI: 10.1016/s0039-6109(05)70573-9
39. Chennakkattu K, Sadasivan P, Sharma CP. Absorbable polymer is surgical sutures: Chemistry, production, properties, biodegradability, and performance. J Biomat Appl. 2010;25(4):1-77. DOI: 10.1177/0885328210384890
40. Persia RD, Guzman A, Rivera L, Vazquez J. Mechanisms of biomaterials: Sutures after the surgery applications of engineering mechanics in medicine, Puerto Rico: GED–University of Puerto Rico; 2005. 1-27 pp. [available at]
41. Storck M, Orend KH, Schmitz-Rixen T. Absorbable Suture in Vascular Surgery. Vasc Surg. 1993;27(6):413–24. DOI: 10.1177/153857449302700601
42. Gersak B. Comparison between absorbable and non- absorbable sutures in arterial Anastomosis in growing dogs. J Cardiovasc Surg. 1991;32(6):757-760. [available at]

تأثير خيط البولي كلاتين والبولي بروبايلين على التئام الجرح المستحدث للتامور في الكلاب

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الخلاصة

صمم هذا البحث لمعرفة تأثير خيط البولي كلاتين والبولي بروبايلين على التئام التامور في الكلاب. في هذه الدراسة تم استخدام أثني عشر كلبا بالغا حيث قسمت الحيوانات الى مجموعتين متساويتين. في كل الحيوانات بعد إحداث التخدير العام وربط الحيوانات بالة تهوية الضغط الإيجابي تم استحداث شق جراحي في التامور وبطول ٢ سم. تم إغلاق الشق الجراحي للتامور في المجموعة الأولى بخيط البولي كلاتين ٠/٢ باستخدام طريقة النمط البسيطة المستمرة، في حين تم غلق الشق الجراحي للتامور في المجموعة الثانية بخيط البولي بروبايلين ٠/٢وبنفس طريقة الخياطة أيضا. تم الاعتماد على دراسة التغيرات العيانية والنسجية بعد ٧ و ٢١ يوما بعد العملية وذلك لمعرفة الفرق بين الخيطين على عملية التئام التامور. أظهرت النتائج العيانية في كلا المجموعتين حدوث تثخنات في التامور حيث أصبح غير شفاف في قوامه إضافة الى حدوث درجات متفاوتة من التصاقات ما بين منطقة غلق الشق الجراحي والأنسجة المجاورة. أما النتائج النسجية المرضية في كلا المجموعتين فقد أظهرت تكوين نسيج حبيبي جديد، ارتشاح للخلايا الالتهابية، احتقان للأوعية الدموية ووجود نضحة ليفينية. حيث تميزت المجموعة الأولى بحدوث تفاعل التهابي شديد أكثر شدة مقارنة بالمجموعة الثانية. بالاستنتاج أن غلق التامور بخيط البولي بروبايلين أفضل من خيط البولي كلاتين تقريبا.