

Effect of Dressing With Chlorhexidine Acetate Applied for Different Lengths Following Ovariohysterectomy Operation

(Ovariohisterektomi Operasyonunu Takiben Farklı Sürelerde Kullanılan Chlorhexidin Acetat'lı Pansumanın Yara İyileşmesine Etkisi)

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SUMMARY

In this study, clinically healthy 48 nulliparous bitches in different breeds were used. Bitches were randomly assigned to 3 groups. In Group I (n=16), dressing with chlorhexidine acetate and bandage were applied immediately following ovariohysterectomy operation (day 0) and removed on day 3. No additional application was applied until removing the surgical sutures. In Group II (n=16), same dressing material and bandage were applied and replaced with same materials on day 3. The replacement dressing material and bandage were removed on day 6. In Group III (n=16), instead of dressing with chlorhexidine acetate and bandage, daily dressing with betadine was applied as postoperative care. Ovariohysterectomy operation was performed on either median line or left abdominal cavity. Skin at incision site was seved by applying "U" sture with silk suture material (usp:0). Following operation, surgical wound along the incision line was covered with tulle gras dressing consist of chlorhexidine acetate. Afterwards, bandage was applied to cover and fix the tulle gras. At the end of day 6, surgical suture materials were removed and bitches were evaluated with regard to recovery was done by inspection. The highest incidence of complications regarding recovery of surgical wound was in Group III. The best result was obtained in Group II. Occurrence of complications (opening the lips of wound and infection

at surgical site) during wound recovery was found as 6.25%.

As a result, it was concluded that application of dressing with chlorhexidine acetate following ovariohysterectomy operation could decrease complications and effort effort for post-operative care to the minimal level during healing of wound.

Key Words: Bitch, Chlorhexidine acetate, ovariohysterectomy, wound healing.

ÖZET

Araştırmada yaşları 10-26 ay arasında değişen, daha önce doğum yapmamış, farklı ırklardan ve klinik olarak sağlıklı 48 dişi köpek kullanıldı. Köpekler her grupta 16 köpek olacak şekilde 3 gruba ayrıldı. Birinci gruptaki (Grup I) köpeklere operasyondan sonra uygulanan chlorhexidin acetate'lı pansuman ve bandaj, 3. gün sonunda alındı ve dikişler alınana kadar başka bir uygulama yapılmadı. İkinci gruptaki (Grup II) köpeklere uygulanan pansuman ve bandaj, 3. gün sonunda yenisi ile değiştirildi ve uygulanan ikinci bandaj 6. gün sonunda alındı. Üçüncü gruptaki (Grup III) köpeklere ise chlorhexidin acetate'lı pansuman ve bandaj uygulanmadı, günlük olarak betadin ile pansuman yapıldı. Ovariohisterektomi yapılacak köpeklerin operasyon seçim yeri median çizgi ya da sol açlık çukurluğuydu. Operasyonda deriyi kapatmak için yatay "U" dikişi uygulandı ve ipek iplik (usp: 0) kullanıldı. Operasyondan sonra, Grup I ve II'deki köpeklerde yaranın, üzeri ensizyon yarasına paralel olarak chlorhexidin acetat içeren tül sargı ile kapatıldı. Bunu takiben köpekler, tül sargıyı örtecek ve tülün kaymasını önleyecek şekilde bandaja alındı. Altıncı günün sonunda dikişler alındı ve inspeksiyonla değerlendirme yapıldı. Yara iyileşmesinde en fazla komplikasyona Grup III'deki köpeklerde rastlandı. Araştırmada en iyi sonucun alındığı grup, Grup II oldu. Yapılan araştırmada yara iyileşmesinde meydana gelen komplikasyon % 6.25 olarak saptanmıştır.

Sonuç olarak, ovariohisterektomi operasyonundan sonra yapılan chlorhexidin acetate'lı pansumanın yara iyileşmesinde komplikasyonları azalttığı ve postoperatif bakım zahmetini en aza indirdiği belirlenmiştir.

Anahtar Kelimeler: Köpek, chlorhexidin acetate, ovariohisterektomi, yara iyileşmesi.

INTRODUCTION

Postoperative care is as costly as an operation and it takes a long time period. In addition to cost and time, failure of healing of operation wound cause more difficulty for postoperative care. All of the applications including protection of the wound from external effects and supporting the wound healing are called as dressing (1). Complication of postoperative wound would exist due to absence of dressing or use of improper dressing material. There are hundreds of dressings materials on the market to aid in wound management. Recent innovations in surgical materials have helped to enhance wound healing and protect surgical wounds from infection (3). Before selecting a dressing for a particular

wound, a practitioner must assess carefully the needs of the wound to understand which dressing would provide maximal benefit (6). Ideally dressing material should minimize pain, prevent unnecessary loss of body fluids to the periphery, exclude microorganisms from the wound, protect the wound against physical damage and be nontoxic and nonirritating to the tissue (5).

Chlorhexidine has rapidly gained popularity as an antiseptic agent for wound therapy. Its advantages better antibacterial activity in the presence of blood, pus and other organic debris, less systemic absorption and toxicity, and more rapid wound healing (4,9). Results of previous studies have helped establish a concentration range for chlorhexidine that is effective yet not deleterious to wound healing (7). For *Staphylococcus aureus*, this range is approximately 0.05-0.1% (10). The aim of this study was to compare postoperative wound healing in canine ovariohysterectomy following the different time use of chlorhexidine acetate and to decrease postoperative outcomes.

MATERIALS and METHODS

In this study, clinically healthy 48 nulliparous bitches in different breeds (23 German Shepherd Dog [GSD], 17 Labrador [LAB], 5 Pointer [PO] and 3 Millinois [MA]) with different ages (10-26 months) were used. Bitches were randomly assigned to 3 groups. In Group I (n=16), dressing with chlorhexidine acetate and bandage were applied immediately following ovariohysterectomy operation (day 0) and removed on day 3. No additional application was applied until removing the surgical sutures. In Group II (n=16), same dressing material and bandage were applied and replaced with same materials on day 3. The replacement dressing material and bandage were removed on day 6. In Group III (n=16), instead of dressing with chlorhexidine acetate and bandage, daily dressing with betadine was applied as postoperative care. Immediately prior to an operation, general anesthesia was performed by administering atropin (0.01 mg/kg, s.c) followed by xylazine HCl (3 mg/kg, i.m) and ketamine HCl (15 mg/kg, i.m). Ovariohysterectomy operation was performed on either median line or left abdominal cavity. Skin at incision site was sealed by applying "U" suture with silk suture material. Following operation, surgical wound along the incision line was covered with tulle gras dressing consist of chlorhexidine acetate (Bactigras, Smith-Nephew, England). Afterwards, bandage was applied to cover and fix the tulle gras. Immediately after surgery, long acting amoxiciline (15 mg/kg, i.m) was administered to the bitches. After bitches were hospitalized and observed in clinic for 24 hours following surgery, they were sent to their shelter. Housing and feeding conditions are same for all dogs in this experiment. At the end of day 6, surgical suture materials were removed and bitches were evaluated with regard to recovery was done by inspection. At inspection, general health status of bitch, the state of wound lips, presence of discharge of wound area and type of discharge (serous, mucus and purulent) if any, were recorded.

RESULTS

Upon opening the bandage at the end of day 3, existence of granulation tissue along the incision line was observed in bitches without any complications. When bandages were opened, it was observed that three dogs had destroyed and slipped dressing. Moreover, it was determined that the leakage transudate at wound area was absorbed and drained by dressing. At the end of day, wound healing was observed in bitches without any complications. During evaluation at the end of the day 6, it was observed that two bitches had serous discharge, and two bitches had mucus discharge in Group I; two bitches had serous discharge and one bitch had mucus discharge in Group II; two bitches had serous discharge, three bitches had mucus discharge and two bitches had purulent discharge in Group III. The highest incidence of complications regarding recovery of surgical wound was in Group III. The best result was obtained in Group II. It was recognized that four bitches in Group III, traumatized the wound area, and among those two bitches had opened sutures. Although incision line was exactly closed in one of the bitches in Group I, purulent discharge was observed from the sides of surgical sutures. Serous discharge that leaking from suture wholes was seen two dogs in Group I and three dogs in Group III. It was accepted that there were complications in terms of recovery of wound in bitches with infection at surgical site (purulent discharge from sides of sutures in Group I and along the incision line in Group III). Occurrence of complications (opening the lips of wound and infection at surgical site) during wound recovery was found as 6.25%.

DISCUSSION

Surgical removal of the ovaries and uterus in female dogs for control of reproduction has been performed. Removal of the ovaries not only controls reproduction in the dog but stops behavioral and physiologic changes characteristic of estrus that may be distressing to the owner, such as exudation of serosanguineous discharge from the bitch's vulva and attraction of male dogs. A significant benefit of early ovariohysterectomy is reduction in incidence of mammary neoplasia (2). Because of these reasons explained above ovariohysterectomy is often performed leading to post-operative complications. Other studies have reported the frequencies of complications in elective ovariohysterectomy in dogs as ranging from 1% to 24% (8). Johnston et al. (2) declared the occurrence of complications at surgery and following surgery in bitches between 7.3% and 27.4%. Moreover; they reported that 13.7-20% of those complications were opening the edges of wound, infection derived from suture material, peritonitis and eventration of intestines. In this experiment, occurrence of complications (opening the edges of wound and infection at surgical site) during wound recovery was found as 6.25%.

Lozier et al. (7), reported that granulation tissue for wound recovery started to exist 3-5 days during post-operative period. Van Winkle et al. (12), indicated that

collogen synthesis was at maximum level during the first five days at wound area. In this experiment, granulation tissue was found at the end of day 3 in causes without any complications regarding wound recovery.

As a wound dressing material, chlorhexidine has been shown to be effective in reducing bacterial numbers and promote second intention healing of infected wounds. Chlorhexidine is most effective in an alkaline environment (7, 10). Evaluations based on criteria described previously in this experiment indicated that the highest rate of complications was found in Group III. This highest complications in Group III compared to Groups I and II could be due to the possitive effect of chlorhexidine acetate treatment on healing of wound for three days or replacement of dressing with chlorhexidine acetate at the and of day 3 following ovariohysterectomy. Especially, in the cases of high number of bitches for a surgical operation and inadequate post-operative care, application of dressing including chlorhexidine could decrease complications during healing of wound. Therefore, post-operative nursing efforts and costs for post-operative care could be decreased, and animals could be protected from stress during recovery.

Sylvestre et al. (11), declared that some dogs could not tolerate the sture materials and they could have reactions against suture materials. Discharges at surgical suture sites despite absence of infection at wound area and closed-healed wound lips could imply sensitivity to suture materials in this study.

In this experiment, it was concluded that application of dressing with chlorhexidine acetate following ovariohysterectomy operation could decrease complications and effort for post-operative care to the minimal level during healing of wound.

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ARAŞTIRMA ÖZETİ

Bufalo Buzağlarında Travmatik Artritis Olgularında Sinovial Sıvı Transfüzyonunun Terapötik Etkisi

(Therapeutic effects of synovial fluid transfusion in induced traumatic arthritis in buffalo calves: an experimental study)

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Deneyisel olarak travmatik artritis 18 Murrah bufalo buzağısında genu eklemi femorapateller boşluğuna 2 ml turpentine oil enjeksiyonu ile oluşturulmuş ve buzağlar altışarlı olmak üzere üç eşit gruba ayrılmışlardır. Grup I kontrol olarak ayrılmış, Grup II 3 ml taze snovial sıvı + 40 ml prednisolon acetate, Grup III ise 3 ml taze snovial sıvı+100 mg diclofenac sodium uygulanarak sağaltılmışlardır. Bütün gruplar 7, 14, 21 ve 28. günlerde artritis oluşması sonrasında klinik bulgular yönünden muayene edilmişlerdir. Bu süreçte sinovial sıvı örnekleri analiz için toplanmıştır. Eklem çevresinde ve topallık yönünden 7 gün sonra Grup II, takiben Grup III ve I de anlamlı bir azalma bulunmuştur. Eklem çevresi, topallık ve eklem krepitasyonu değerlendirilmesi çerçevesinde snovial sıvıda azalma steroid ve nonsteroid alantienflamatuvar ajan grupları arasında farklı bulunmuştur. Snovial sıvıda lökosit sayısında ve nötrofil oranında artış, lenfosit sayısı ve monosit oranında azalma keza glukoz azalması, protein ve alkalın fosfataz aktivitesinde artış görülmüştür. Sonuç olarak bufalo buzağlarında artritis sağaltımında taze otolog sinovial sıvı ve bunun steroid ve nonsteroid alantiinflatör ajanlarla intraartiküler enjeksiyonu etkili olmaktadır. Sinovial sıvı + prednisolon enjeksiyonu, sinovial sıvı + diclofenac uygulamasından daha etkilidir.