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Surgical excision of massive sterile pyogranuloma using thoracodorsal skin flap pattern in a dachshund dog

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Abstract

A six month old female intact Dachshund weighing 7 kg was presented to Small Animal Clinic – Outpatient Surgery Unit of MVC Teaching Hospital with history of progressive nodular enlargement on palmar aspect of right forelimb. On clinical examination, mass was hard, indurated and non painful with multiple nodules extending from palmar aspect of elbow region to carpal region with mild hair loss on the lateral aspect. On the day of presentation, survey dorsopalmar and lateral radiograph of right forelimb and lateral thoracic radiograph was taken to rule out bony involvement and metastasis if any respectively which revealed absence of abnormality and culture was negative for sample. Fine needle aspiration cytology was taken to investigate the nature of cells. Since FNAC was inconclusive. The following day punch biopsy was taken with the consent of the owner to investigate the abnormality. The post operative wound defect was thereby measured and was used to mark the dimensions of the thoracodorsal flap. Subjective evaluation of flap was performed to assess color, odor and exudates. Color flow Doppler was performed on 7th, 14th and 21st day to assess vascularity and flap uptake. Growth of hair follicles, warmth of flap and absence of any flap complication substantiates complete flap uptake and uneventful recovery.

Keywords: Sterile pyogranuloma, wound defect, thoraco dorsal skin flap, dog

Introduction

Cutaneous sterile pyogranuloma/granuloma syndrome (SPGS) is a skin disease that is uncommon in dogs and extremely rare in cats [1]. SPGS is also termed idiopathic periadnexal multinodular granulomatous dermatitis. No age or gender predisposition is reported; however, boxers, golden retrievers, collies, Great Danes and Weimaraners may be predisposed, and male dogs seem to be affected at a higher frequency [2].

Characteristic skin lesions are usually observed on the bridge of the nose, muzzle, periocular region, pinnae, and paws [3]. These lesions comprise dermal papules and nodules, which are multiple, well demarcated, firm, painless, and nonpruritic. They may become alopecic and ulcerated and may get secondarily infected, particularly on the paws. Although systemic signs such as lymphadenopathy and hypercalcemia have been reported in dogs and cats, the affected animals are typically healthy.

Case history and treatment

A six month old female intact Dachshund weighing 7 kg was presented to Small Animal Clinic – Outpatient Surgery Unit of Madras Veterinary College Teaching Hospital with history of progressive nodular enlargement on palmar aspect of right forelimb. On clinical examination, mass was hard, indurated and non painful with multiple nodules extending from palmar aspect of elbow region to carpal region with mild hair loss on the lateral aspect. Mass measured approximately 12.3cmx 3.7cm in dimension (Fig.1). On the day of presentation, survey dorsopalmar and lateral radiograph of right forelimb and lateral thoracic radiograph was taken to rule out bony involvement and metastasis if any respectively which revealed absence of abnormality and culture was negative for sample. Fine needle aspiration cytology was taken to investigate the nature of cells. Since FNAC was inconclusive. The following day punch biopsy was taken with the consent of the owner to investigate the abnormality. Punch biopsy results revealed the presence of epitheloid macrophages in periphery and neutrophils in the centre which was confirmative of sterile pyogranuloma.

Antibiotic therapy with Cephalexin @ 50mg/kg PO once daily for 7 days was administered in addition to glucocorticoid therapy with Prednisolone @ 2.5mg/kg PO once daily for 15 days. As the pharmacotherapy was ineffective and lesion was progressive in enlargement, a surgical intervention was planned. Preoperative hematobiochemical analysis revealed leucocytosis with neutrophilia, mild anaemia with increased levels ALP and Ca:P ratio.

Pet was fasted 12 hrs prior to surgery and surgical site was aseptically prepared. Since the post operative defect was very wide and standard suturing technique was very difficult, an alternative reconstructive skin flap was planned. A thoraco dorsal skin flap was therefore decided to be performed. Premedicated with diazepam, butorphanol @ 0.5 mg/kg, 0.1 mg/kg BW intravenous respectively followed by induction with Propofol @ 4mg/Kg BW intravenously. Intubation with 6.0 ID cuffed endotracheal tube was performed following induction and anaesthesia was maintained with Isoflurane with Oxygen as carrier gas. Carbon dioxide diode laser with frequency of 13Hz was used to delineate and excise margins of sterile pyogranuloma. Following excision of the mass hemorrhages was arrested using the laser.

The post operative wound defect was thereby measured and was used to mark the dimensions of the thoracodorsal flap. Felt pen marker was used to mark the dimensions of the thoracodorsal flap. With the dog in lateral recumbency, the lateral cervical and thoracic skin is grasped, lifted, and allowed to spontaneously retract to a normal position. The forelimb is placed in relaxed extension perpendicular to the trunk. Cranial border of the flap was 2 inches anterior to the spinous process of the scapula. Caudal border of the flap was 4cm posterior to the cranial border. Cranial and caudal border was connected by dorsal border. Length of the pedicle was equal to 4cm which was the width of the defect. Incisions of the flap margins done with BP blade No 11 and following which flap was undermined carefully and elevated taking care not to damage the primary vasculature (Thoracodorsal vessel). Intradermal suture was applied with help of PGA 2-0 in simple continuous pattern following which the skin was sutured with Polyamide 3-0 in cross mattress pattern (Fig 2). Care was taken to avoid excessive dog's ear. Post operative treatment with Cepodoxime @ 5 mg/kg orally SID for 7 days and Penetrat pet (Trypsin, Bromelain, Rutoside Trihydrate) @ 1 tablet SID was given and alternate day dressing was done.

Subjective evaluation of flap was performed to assess color, odor and exudates. Color flow Doppler was performed on 7th, 14th and 21st day to assess vascularity and flap uptake. Growth of hair follicles, warmth of flap and absence of any flap complication substantiates complete flap uptake and uneventful recovery.

Discussion

The diagnosis of cutaneous SPGS is challenging and can be made only after ruling out other granulomatous and pyogranulomatous skin diseases [4]. The etiology of granulomatous and pyogranulomatous skin diseases can be divided into two major groups [5]. The first group is infectious diseases caused by protozoans, mycobacteria, pathologic dimorphic fungi, etc. and noninfectious diseases with a known etiology such as a foreign body, hair, sebum, etc. The second group includes unknown etiologies, such as idiopathic "sterile" dermatitis as observed in the present case. The absence of infectious agents and foreign materials together

with a good response to systemic glucocorticoids suggested the involvement of immune-mediated mechanisms [6] which was unresponsive in the present case. In the present case, neither causative organisms nor foreign bodies were detected by culture, impression smears, special histopathological staining, or PCR for Mycobacterium spp. Since the mass was extensive and was not responsive to conservative therapy and hence an excision was performed using a laser since Laser has been found to accelerate wound healing by possibly stimulating oxidative phosphorylation therefore reducing the inflammatory response and pain at the nerve endings [7]. The post operative defect was massive hence a thoracodorsal flap was performed.

The thoracodorsal axial pattern flap is based upon the cutaneous branch of the thoracodorsal artery and associated vein [8]. The moderately sized thoracodorsal direct cutaneous artery arborizes in a dorsal direction behind the scapula. Great care must be taken to avoid injury to the thoracodorsal artery and vein: subcutaneous fat frequently obscures the ability to visualize them. The thoracodorsal flap can be pivoted into a variety of defects. The flap may be partially tubed to reach a distant defect or sutured to a bridge incision to traverse the skin interposed between the donor and recipient sites. The peninsular design can extend down to the contralateral scapulohumeral joint, whereas the hockey-stick variation is shortened to accommodate the angular extension as observed in the present case. Thoracodorsal axial pattern flaps of considerable length can be developed to cover defects involving the shoulder, forelimb, elbow, axilla, and thorax in the dog and cat as performed in the present case [9]. Development of long thoracodorsal axial pattern flaps may necessitate division of the opposite cutaneous branch of the thoracodorsal artery and vein [10, 11]. When feasible, it is preferable to position forelimb defects for immediate flap transfer rather than repositioning the patient intraoperatively [12].



Fig 1: Pyogranuloma measured 12.3cmx 3.7cm in dimension



Fig 2: Reconstruction of thoraco dorsal flap after excision of pyogranuloma

Conclusion

Successful surgical management of massive sterile pyogranuloma using thoracodorsal skin flap pattern in a dachshund dog and its outcome.

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