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Evaluation of genicular axial flap pattern graft for repair of large skin defect in hock joint of dogs affected with various tumours

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Abstract

The present study involved large skin defects created due to tumors of hock region in two dogs presented to Department of Vet. Surgery & Radiology, CVSc & AH, Bhubaneswar affected in 2022. The objective of this study was to evaluate the clinical outcome of repair of skin defect done through genicular axial pattern graft in the thigh region of hind limb during removal of tumors in small breed dogs. Defects created due to tumor excision were closed through genicular axial pattern flaps in starting from distal tibia to the lower hock region. The clinical outcome, wound closure and healing were very promising and is an example of case-based application. The above findings suggested that genicular axial pattern flaps are a good option for reconstruction of large cutaneous defects of the lateral aspects of the tibia and hock joint in dogs.

Keywords: Mast cell tumor, soft tissue sarcoma, genicular axial pattern flap, anal sac apocrine gland adenocarcinoma, lymph node

Introduction

Large skin wounds on the pelvic limb and stifle and hock joint possesses multiple medical challenges and closure through surgical reconstruction^[1]. Skin defects in hindlimb may occur due to accidental injury, chronic nonhealing wound, and skin tumors such as squamous cell carcinoma, mast cell tumor, anal sac apocrine gland adenocarcinoma, buttock sarcomas or skin lesion due to viral affections etc. with concomitant regional lymph node metastasis^[2, 3, 4, 5, 6, 7]. Axial pattern flaps for closure of large defects survive easily because it incorporates with it direct extension of cutaneous artery, veins and subdermal plexus. Genicular axial pattern flap graft is based on the drainage pattern of saphenous artery and medial saphenous vein in hindlimb area^[8, 9]. Large skin defects starting from proximal tibia up to lower hock region can be covered and has several advantages over the random or subdermal plexus flaps due to lack of vascularity in later cases. The survival rate with axial flap pattern is usually higher approximately 87-100%^[10].

In this section, application of genicular axial pattern flap has been described in three different cases of road accident, mast cell tumor and soft tissue sarcoma. To the best of author's knowledge, clinical outcome with such type of larger skin reconstruction are very rare in literature.

Case history and observation

An 8kg, male pug, 9 years operated twice before for skin tumor was admitted for further treatment at our hospital. There was bleeding, ulceration and itching of site tempting the animal for licking of the wound. Blood examination, orthogonal radiography, three view thoracic radiography and lymph node palpation along with B-mode ultrasonography of the popliteal lymph node, medial iliac lymph node was done for clinical staging of the skin tumors according to Owen's TNM staging^[11, 12]. Preoperative fine needle aspiration cytology and surgical excision, biopsy and histopathology of the cancerous tissue was performed for confirmation of the tumor grading and types. Another mongrel dog, 15 kg, male was registered for chronic ulcerative skin tumor in proximal hock region. The animal was active, with no other complaint such as pain and dullness. Routine clinical examination with complete

blood count, liver function test (Aspartate aminotransferase, alanine aminotransferase and Alkaline phosphatase) and blood urea nitrogen, creatinine were performed.

Diagnostic radiography such as orthogonal view of the lesion, three view thoracic radiography and B-mode ultrasonography of the lesion and regional lymph node were carried out to record the possibility of regional metastasis.

Surgical procedure for flap reconstruction

Two parallel incisions were developed from these points parallel to the diaphysis of the femur. The flap was carefully elevated deep to the subcutaneous fat with particular care to avoid damaging the direct cutaneous arteries at the base of the flap. The full length of the flap was elevated in all cases. The flap was rotated as required to reach the defect; rotation ranged from 90 to 180°. Bridging incisions were created as required for the flap to reach the defect (Fig. 1 and Fig.2). The flap was sutured to the defect with Trulon no-1 and Robert John's bandaging was applied to reduce the movement at the wound bed.

Result and discussion

Cytological examination of tissue sample collected from hock of pug stained with Giemsa stain identifies it to be mast cell tumor in preliminary stage. Further, histopathology of the excised surgical mass along with clinical staging confirmed the tumor to be Grade-II, mast cell tumor. Postoperative antibiotic and regular wound dressing causes healing of the skin defects within 15 days in both cases. In mongrel dog, the histopathology of the excised mass confirmed to be soft tissue sarcoma (fibrosarcoma) and with stage I grading. In both the cases, the healing was very and we consider axial pattern flap as a better option considering movement of the limb and vasculature in the surrounding area.

Conclusion

Genicular axial pattern flaps can be used to reconstruct large skin defect in hind limb region in both small and large breed dogs including cats



Fig 1: Surgical reconstruction of mast cell tumor in hind limb of pug through genicular axial pattern flap and histopathology of the excised mass showing grade II mast cell tumor.



Fig 2: Surgical reconstruction of ulcerative soft tissue sarcoma at the hock joint closed with genicular axial pattern flap and post operative healing case. Histopathology of the same with fibroblast cell population in H&E staining.

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