

Reconstruction Of Extensor Apparatus Of Knee By Gracilis

**Dr. J.K. Sinha, M.S., F.R.C.S.
Dr. K.K. Mangal, M.S. M.Ch.**

KEY WORDS :

Leiomyosarcoma.

ABSTRACT :

Marginal excision, wide excision with radieal resection, hip disarticulation and hemipelvectomy are the operative modalities in vogue for the surgical management of lower extremity sarcomas. Leiomyosarcoma of lower one third of thigh is treated by wide excision and resultant defect is filled by gracilis transposition technique.

INTRODUCTION :

Soft tissue sarcomas remain relatively uncommon neoplasms. They comprise of 0.7% of all cancers as per American cancer society survey (Chang et al 1989). Various studies show that 60% of sarcomas occur in the extremities. (Collin et al 1986, Shire et al 1975, Lawrence et al 1987). Tumour incidence in lower extremity is 3.5 times more as compared to the upper extremity, tumours (Murray 1989). About 62% to 66% of lower extremity sarcomas occur around knee and in thigh in lower to thirds (Collin et al 1986, Murray 1989). Lawrence et al 1987 observed that about two third of sarcomas are of high grade. These rarely spread to regional lymphnodes (Weingrade et al 1978). Leiomyosarcomas are malignant tumours arising from smooth muscle (While et al 1981). They comprise of nearly 20% of all soft tissue sarcomas (Murray 1989). National institute of health consensus conference in 1984, concluded that limb sparing treatment for some of these sarcoma patients was an effective treatment (Delisa et al 1989). Present case is an efforts to reconstruct the functional apparatus for

extension of knee in addition to limb sparing, following excision of soft tissue sarcoma above the knee joint.

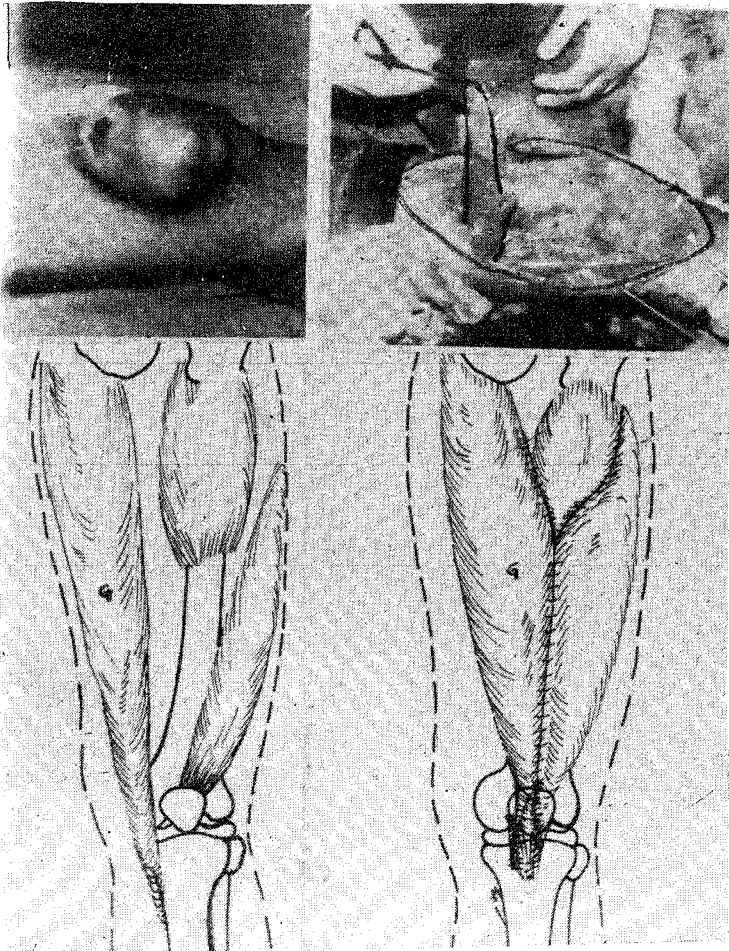
CASE REPORT :

A patient, 45 years male, presented with swelling measuring 10 x 7 cm. in lower left thigh on the antero-medial aspect just above the knee. Swelling had enlarged over last 12 months. Clinically, inguinal lymph nodes were not affected. X-ray chest did not show any evidence of metastasis. Fine needle aspiration biopsy was reported as undifferentiated sarcoma. Excisional biopsy was reported as leiomyosarcoma grade IV.

RESECTION :

Three dimensional wide excision was done taking 6 cm. skin margin. Parts of anterior compartment muscles which were affected were excised such as parts of rectus femoris, vastus medialis, lower half of vastus intermedius and sartorius. This resulted in a wide defect of skin, loss of extensor

PHOTOGRAPHS.



Figures :

1. Tumour Preoperatively
2. Gracilis Muscle Being Elevated with Post Excisional Defect.
3. Anatomy of Gracilis Muscle.
4. Gracilis Being Transpositioned.

apparatus of knee and exposure of the lower part of femur with intact periosteum.

RECONSTRUCTION :

Gracilis muscle was indentified at insertion between sartorius and semitendinosus. It was detached from insertion, muscle was then elevated upto its major vascular pedicle, the medial circumflex femoral artery in upper part of thigh. Minor vascular pedicles (branches of anterior femoral artery) were preserved. The muscle was then transferred to anterior compartment of thigh and tendinosus lower end inserted into ligamentum patellae. Its border was sutured to vastus lateralis.

This apparatus so formed was sutured to lower cut end of vastus intermedius. Thus forming a triflanged extensor apparatus. The exposed femur was covered by the gracilis muscle.

All bare muscles were covered with split thickness skin graft taken from contralateral thigh.

POST-OPERATIVE :

Splint was removed after two weeks and the patient was allowed guarded movements of the knee joint. There was restriction of flexion to some extent. The patient was able to walk with movements at the knee joint and not by compensatory use of gluteus maximus muscle.

DISCUSSION :

Surgical management of such lesions involve three important aspects : resection, reconstruction and skin coverage (Delisa et al 1989).

Wide excision is the most commonly used surgical procedure performed for extremity sarcomas. In a survey by the American College of Surgeons approximately half of all sarcomas were treated by wide excision (chang et al 1989). Prophylactic removal or radio-therapy of draining lymph node areas in most adults with sarcomas does not appear to be worth while (Weingrade et al 1978). Concept of limb sparing surgery in extremity sarcomas is relatively recent. At present at Slone Kettering Cancer Centre, New York, 85% of Patients

undergo limb sparing surgery (Murray 1989).

Patients with lower extremity sarcoma are at significant risk of developing mobility problems when they undergo wide excision and radiotherapy. These patients require orthotic appliances to control knee extension, particularly when quadriceps has been excised (Delise et al 1989).

Functional outcome depends on the soft tissue excised but a limp of gluteus maximum type is observed. Surgical decision about how much soft tissue to resect will in part determines the functional outcome.

Hess et al (1986) used sartorius muscle transposition for reconstruction of extensor apparatus of knee.

Gracilis, a muscle of medial compartment of thigh and a strong adductor having a high degree of mobility has been used for many different purposes e.g. anal sphincter reconstruction (Williams et al 1990) rectovaginal fistula repair (Gorestein et al 1988), and in knee for cruciate ligament repair (foretti 1989). Use of gracilis to reconstruct the extensor apparatus of knee can be a good choice when tissue of anterior compartment is not available. Gracilis muscle after insertion in ligamentum patellae have two components of action. The medial pull is neutralised by the action of vastus lateralis. Proximal pull (Extension of knee) is aided by the action of vastus intermedius and vastus lateralis which were sutured together as shown in the diagram.

Clearly, limb sparing procedures have greater potential than amputation.

REFERENCE :

1. Chang A.E. Rosenberg S.A., Glatstein E.J., Antman K.H. Edited by Devita V.T., Hellman S., Rosenberg S.A. ; Sarcomas of soft tissues ; Cancer, Principles and practice of oncology 3rd edition. Philadelphia: J.B.Lupincott. 1989.
2. Collin C., Hadju S.I., Gold J., Shitt M.H., Hilaris B.I., Brennan M.F. Localised toperable soft tissue sarcomas of the lower extremity. Arch. Surg. 1986; 121 : 1425-33.
3. Costa J.W. Esley R.P., Glatstein E., Resenberg S.A. ; The grading of soft tissue sarcomas. Histopathology, results of histopathologic correlation in a series of 163 cases. Cancer : 1984; 53 : 53 - 41.
4. Delisa J.A., Miller R.M. Melnick R.R., Gerber L.H., Hittel A.D. : Rehabilitation of cancer patient. Cancer principle of practice of oncology. Edited by Devita V.T., Hellman's, Rosenberg S.A. 3rd edition. Philadelphia : J.B. lupincott 1989 : 2333-68.
5. Forett A. et al Results of reconstruction of anterior crociate ligaments with semitendinos an gracilis tendons in chronic laxity of knee: J. Orthop. Traumatology, 1989; 15: 415-24.
6. Gorestein L.: Gracities msclre repair of retrovaginal fistula after restorative proctocolectomy report of two cases; Dis. Col. Rectum : 1988; 31 (a) : 730-34.
7. Hare H.F., Cerny M.J. : Soft tisse sarcoma, A review of 200 cases. Cancer ; 1963; 16 : 13332.
8. Hess P.: Transposition of sartorius muscle for reconstruction of extensor apparatus of knee. J. trauma 1986; 26 : 90-92.
9. Lawrence W., Donegan W.I., Natarajna N., Mellinic., Beert R., winchester D.: Adult soft tissue sarcomas, A pattern of care survey American College of surgeons. Ann. Surg. 1987; 205: 349- 59.
10. Murray F.B., Management of extremity soft tissue sarcoma. American J. Surg. 1989; 158: 71-78.
11. Rydholm A., Rooser B.D., Persson B.M.: Primary myecotory for sarcoma J. Bone & Joint Surg. 1986. 68(A); 586-89.
12. Shri S.H., Castro E.B., Hadju S.I., Farther J.G., Surgical treatment of 297 soft tisse sarcomas of lower extremity. Arch. Surg. 1986. 121:1425-33.
13. Weingrade D.n., Rosenberg S.R.: Early lymphatic spread osteogenic and soft tissue sarcoma. Surgery 1978, 84 : 231-40.
14. Wile A.G., Evons H.L., Ramsdahl M.M.: Leiomyosarcoma of soft tissue. a clinicopathological study. Cancer 1981; 48: 1022-32.

AUTHOR'S NAME AND ADDRESS :

1. Dr. J.K. Sinha M.S., F.R.C.S.,
Professor & Head.
2. Dr. K.K. Mangal. M.S., M.Ch., Senior Resident.

Division of plastic surgery, Institute of Medical Sciences, Banaras Hindu University VARANASI