MULTIMODALITY MANAGEMENT OF SOFT TISSUE SARCOMAS

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INTRODUCTION

Soft tissue sarcomas are a heterogeneous group of malignant tumours arising from connective tissues of mesenchymal origin. By definition sarcomas arising from bone or cartilage are excluded though they have much in common in their behaviour as well as in the approach to their management. In this review of our local experience mesotheliomas are also excluded.

The incidence of these tumours has considerable geographic variations. Hawaii has the highest incidence (6.2 per 100,000). The incidence in the U.K. is 0.5 to 0.8 per 100,000 and in the U.S. 2 per 100,000. Over the last 34 months 24 new cases have been diagnosed and notified in the Maltese Islands. This gives an incidence of 2.27.

MATERIALS AND METHODS

A retrospective study of all cases of soft tissue sarcomas diagnosed and notified in the Maltese Islands over the period 1.1.87 to 31.10.89 was carried out. Information was obtained from the cancer registry, the patient's hospital files and radiographic records. When there was reasonable doubt about the diagnosis a review of histological material submitted was carried out.

RESULTS

24 new cases of soft tissue sarcoma were diagnosed in the period 1.1.87 to 31.10.89 (34 months). There were 14 males and 10 females with four sarcomas arising from the uterus, and two arising from breast. There were four children (less than 14 years of age) and two adolescents. Nine patients received surgery alone as their initial treatment. Of these, three patients died in the immediate post operative period, one developed distant metastasis at fifteen months, one developed local recurrence, one is alive and free of disease at eighteen months and the other three are lost to follow up.

Another three patients had surgery limited to biopsy only because of inoperability of the tumour. All these patients are now dead (survival = 1,4,6 months) from disseminated disease.

Eight patients received a combination of surgery and radiotherapy as primary treatment. Five are alive and free of disease, one still has not completed treatment, one is alive and with distant metastasis and one is lost to follow up.

Two patients received surgery and chemotherapy and are both alive and free of disease. Another two patients received surgery, chemotherapy and radiotherapy as their primary treatment. Of these one died of disease at four months and the other is alive and free of disease at two years.

The younger patients did considerably better with all four children being presently alive and free of disease. Three of these children received part of their treatment in the U.K. One adolescent died with extensive local disease all treatment having been refused. The other adolescent remains alive and free of disease.

Of eight patients over the age of sixty years, six are dead, one alive with disease and one alive and free of disease. The thirteen patients still alive have had a median follow up of seventeen months, four cases have been lost to follow up and seven patients are dead.

Table 1 lists all our patients giving histology, site or primary, treatment received and result of follow up.

DISCUSSION

In comparing incidences of soft tissue sarcomas from different regions confusion arises because of uncertainty over which cases to include and which to exclude. For example soft tissue sarcomas arising from viscera are often excluded so that leiomyosarcomas of the uterus or bowel would not be included. Rhabdomyosarcoma arising from bladder, uterus or vagina however is usually included. Likewise some would include mesothelioma but most would not. Using

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TABLE I

HISTOLOGY	SITE	AGE	SEX	1ST TREATMENT	FOLLOW UP
Leiomyosa	Ileum	72	M	Surgery	Died 4 wks post op
Leiomyosa	Uterus	80	F	Pall.RT	Died 4 mths post biopsy
Leiomyosa	Liver	62	M	Surgery	Died 1 wk post op
Rhabdomyosa	Abdo	56	M	Chemo	Died 6 mths post biopsy
Liposa	Thigh	70	M	Surg + RT	FOD 6 mths
Alveolar Sa	Thigh	17	F	Surg + RT	FOD 9 mths
Angiosa	Pelvis	65	F	S+ Ch + RT	Died 4 mths post op
M.F.H.	Head	3	M	Surgery	FOD 18 mths
M.F.H.	Elbow	51	M	Surgery	Immediate post op
C.C.Sa.	Kidney	6 mth	M	Surg + Ch	FOD 14 mths post op
Neurofib Sa	Colon	47	M	Surgery	Liver mets at 15 mths
Myxosa	Abdo	79	M	Pt. Excision	Died 1 wk post op
Cystosa	Breast	43	F	Mastectomy	FOD 11 mths
Pleom.Sa	Pelvis	17	F	Surgery	Died 1 mth
Fibro.Sa	Thigh	56	M	Surgery	Lost to follow up
Rhabdomyosa	Chest	4	M	S+Ch+A.M.T.	FOD 2 yrs
Rhabdomyosa	Leg	30	M	Surg + RT	FOD 18 mths
M.F.H.	Chest	50	M	Surgery	Recur x 2 after Surg
Stromal Sa	Uterus	76	F	Hyst + RT	Lost to Follow up
D.F.P.	Shoulder	44	M	Surg + RT	FOD 2 yrs
Fibro.Sa	Breast	44	F	Mastectomy	Lost to Follow up
Leiomyosa	Uterus	32	F	Hyst + RT	FOD 2 yrs
Leiomyosa	Uterus	62	F	Hyst + RT	Alive with lung mets
Rhabdomyosa	Bladder	7	F	Ch + S + RT	FOD 2 yrs

M.F.H. = Malignant Fibrous Histiocytoma
C.C.Sa. = Clear Cell Sarcoma
D.F.P. = Dermatofibrosarcoma Protuberans
A.M.T. = Autologous Marrow Transplant
Hyst = Hysterectomy
S = Surgery
Ch = Chemotherapy
RT = Radiotherapy

these criteria that is excluding visceral leiomyosarcomas our incidence would fall to 1.7 per 100,000.

Because of the rarity of these tumours few centres have gained much experience in their management. Most important studies on the subject have been the result of multi centre trials.

The prognosis of the various soft tissue sarcomas varies somewhat from one histological variety to another, as does the natural history. By and large however the grade and size of the primary tumour is more important in determining prognosis and treatment than the histological variety of sarcoma. Embryonal rhabdomyosarcoma is the exception and the behaviour and treatment of this tumour is closer to that of other paediatric solid tumours than to that of the other soft tissue sarcomas.

The brief discussion on management that follows refers to non- visceral soft tissue sarcoma and is confined to general principles. Soft tissue sarcomas usually spread by local extension along tissue planes often far from palpable tumour. The development of local recurrence following primary treatment doubles the probability that the patient will die of the sarcoma.

Following simple excision recurrence rates are of the order of 70 to 90% (Table 2). Radical surgery is associated with much lower local recurrence rates, but often necessitates amputation of a limb or other mutilating surgery. For surgery to be radical the tumour which is not visualized at operation must be removed en bloc with a 2/3 centimetre margin in all directions. The results of Simon et al (1) provide an excellent review of what can be attained by radical surgery.

Their local recurrence rate for all patients was 20%. Tumours in inaccessible sites such as pelvis, buttock, groin or shoulder girdle recur more than those in extremities.

Increasing size is also associated with increasing risk of recurrence.

The work of Suit and Russell (2) (Table 3) has clearly shown that equally good local control of the primary tumour can be achieved by a combination of simple excision and radiotherapy.

The two groups, surgery alone vs. surgery plus radiotherapy in our series are not comparable. The numbers for comparable cases are too small for meaningful analysis.

Radiotherapy can be given pre or post-operatively with advantages and disadvantages for both techniques. If radiation is given pre-operatively (3) the volume to be radiated is smaller, inoperable tumours can become operable and the tumour is more clearly outlined at operation. The risk of dissemination at operation is also reduced and treatment starts immediately removing the worrying risk of tumour regrowth post-operatively especially if wound healing is delayed while waiting to start radiotherapy. The main disadvantage is that there may be a delay in wound healing.

When a small lesion is excised and on histological examination turns out to be a sarcoma radiotherapy can only be given post- operatively. Treatment volumes post-operatively must include all areas of possible contamination and are necessary larger. In our series all patients receiving radiotherapy did so post- operatively.

Chemotherapy is used to reduce the size of large tumours thereby facilitating subsequent surgery. It is also used palliatively in the treatment of metastatic disease or of fungating inoperable primaries. Its role in adjuvant treatment is still uncertain but ongoing trials are being carried out in an attempt to identify a drug regimen that may improve results. To date one of the more effective ways of delivering chemotherapy in the treatment of sarcomas arising in an extremity has been by intra-arterial perfusion.

Because of the complex interaction between the different modalities of treatment available in the management of soft tissue sarcomas a planned combined approach between surgeons and radiotherapists/oncologists is essential. It is also very useful for the clinicians to fully discuss these complex cases with their colleagues in pathology and diagnostic radiology. Both surgery and radiotherapy have to be meticulously planned and executed to obtain optimal results.

We now have the facilities to treat the large majority of cases of soft tissue sarcoma adequately in Malta. We will continue to refer most of our children to the U.K. when intensive chemotherapy or highly complex surgery is needed. The chemotherapy programme in these cases which often goes on for several months can usually be continued in Malta. Likewise any radiotherapy needed could also be delivered in Malta with few exceptions.

REFERENCES

1) *SIMON MA, ENNEKING WF: THE MANAGEMENT OF SOFT TISSUE SARCOMAS OF THE EXTREMITIES 1976. J. BONE JOINT SURG. 58-A; 317-327,*

2) *SUIT HD, RUSSELL WO; RADIATION THERAPY OF SOFT TISSUE SARCOMAS, CANCER 1975 36; 759 - 764, 1975.*

3) *SUIT HD, PROPPE KH, MANKIN HJ, ET AL; PREOPERATIVE RADIATION THERAPY FOR SARCOMA OF SOFT TISSUE, CANCER 1981 47; 2267 - 2274, 1981.*

TABLE II

Results of Surgery Alone.
Simon et al. definition of local recurrence rates:

%	
100	following incisional biopsy
80-100	following excisional biopsy
50	following wide excision
10-20	following radical resection
5	following amputation

TABLE III

Results of post-operative radiation

1) M.D. Anderson
   80% local control with
   80% good functional result.

2) Massachusetts General Hospital
   92% local control at 2 years
   84% local control at 5 years

3) Distal lesions
   100% control (46/46)

   Proximal sites (upper arm, thigh)
   36% control.