TUBERCULOSIS CUTIS IN SINGAPORE A TWO YEAR EXPERIENCE

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SYNOPSIS

25 cases of Tuberculosis cutis are recorded over a 2-year period. The clinical features of the different forms are described. Tuberculosis verrucosa cutis or warty tuberculosis was the predominant form seen. Attention is drawn to the problems in diagnosis. Intermittent therapy with high dosage isoniazid and streptomycin appeared ideal for local patients.

The prevalence of tuberculosis in Singapore is declining. However, tuberculosis of the skin is still seen from time to time, and over a period of two years (1971-1972) 25 cases of tuberculosis cutis were seen in this hospital. A total of 38,278 new skin cases were seen in the same period. Thus tuberculosis cutis formed 0·065% of all new skin cases in that period.

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METHOD

Diagnosis of the cases was made on clinical grounds and by histologic study of skin section. Cultures for mycobacteria tuberculosis seldom yield a positive result and were attempted in only a few cases with no success. Ultimate confirmation of the tuberculous nature of the lesions lay in the healing of the lesions with exhibition of tuberculostatic drugs.

Chest X-rays, serologic tests for syphilis, ESR and Mantoux testing with Old Tuberculin (OT) or Purified Protein Derivative (PPD) were done in all cases.

FORMS OF TUBERCULOSIS CUTIS

Tuberculosis verrucosa cutis was the commonest form seen—23 of the total of 25 cases. There was one case of lupus vulgaris and one of scrofulo-

TABLE I

No.	Name	Age	Sex	Site	Size (cm)	Duration of Lesion (year)	Chest X-ray	Mantoux test (1TU) (mm)	BSR
1	T. G. L.	16	M	(R) Heel	5	1	NAD	ND	ND
2	W. A. K.	23	M	(L) Elbow	4	7 mth	NAD	8	3
3	T. P. Y.	45	M	(R) 4th finger dorsum	2	6 mth	NAD	10	ND
4	N. K. C.	23	M	(R) Foot sole	5	10	NAD	20	13
5	C. C. Y.	16	M	(R) Groin	12	4	NAD	NEG	3
6	C. Y. W.	18	M	(R) Knee	5	7	NAD	10	ND
7	K. H. G.	34	F	(L) Foot Dorsum	4	10	NAD	ND	24
8	L. C. G.	7	F	(L) Axilla	6	4	NAD	ND	16
9	Y. F. C.	29	M	(R) Ankle	3	11	NAD	NEG	3
10	G. G. S.	21	M	(R) Buttock	7·5	2	NAD	10	2
11	T. K. H.	7	M	(R) Hand dorsum	5	10 mth	NAD	10	19
12	C. M. H.	35	F	Whole buttock		15	Act Min PTB (R)	NEG	64
13	L. W. K.	14	F	(R) Sole	?	9	NAD	NEG	10
14	R. A.	25	M	(R) Knee	?	1	NAD	20	4
15	C. C. K.	20	M	(L) Palm	?	6 yr.	NAD	ND	ND
16	N. K. H.	23	M	(R) Buttock	?	12	NAD	ND	14
17	L. C. P.	37	M	(L) Ankle	2	1	NAD	ND	?
18	L. P. P.	39	M	Whole Buttock		20	NAD	10	27
19	O. A. J.	29	M	(R) Arm	?	6	NAD	15	15
20	P. V.	33	M	(R) Thigh	5 by 6	15	NAD	10	9
21	A. G. M.	15	M	(R) Foot dorsum	4 by 2	3	NAD	?	42
22	L. H. P.	23	F	(L) Knee	6	10	NAD	20	22
23	L. L. S.	20	M	(L) Knee	?	2	NAD	ND	4
24	T. S. F.	4	F	(R) Forearm	5	2	NAD	25	12
25	H. A. B.	42	M	Scrofuloderma		1	PTB Extensive	ND	101

derma. Table I details the clinical data of the patients. There were two Indians (Cases 14, 20) and one Malay (Case 21), the rest being Chinese.

CLINICAL FEATURES

(a) Tuberculosis Verrucosa Cutis

This is an inoculation tuberculosis occurring in those who have had previous contact with M. Tuberculosis and therefore some degree of immunity.

Bacilli from infected material e.g. sputum of tuberculous patients, enter the skin at sites of minor wounds and abrasions. Usually there is a solitary lesion on those parts of the extremities which are liable to be traumatized e.g. the hands, fingers, legs, knees, elbows and buttocks. The lesions vary in size from a papule to a plaque, the surface of which is warty, the base is infiltrated and firm and the colour reddish (in Chinese). There may be areas of scarring within the lesions (Fig. 1). Histologically the lesions show marked epidermal hyperplasia which may be pseudoepitheliomatous and with an intense mixed dermal infiltrate of lymphocytes and polymorphs. Giant cells are common but tubercles are infrequent and caseation is rare (Figs. 2, 3).

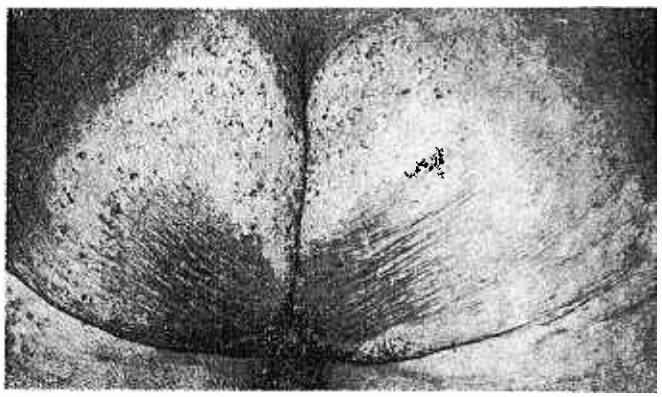

Fig. 1. Tuberculosis verrucosa cutis involving the whole buttock (Case 18).

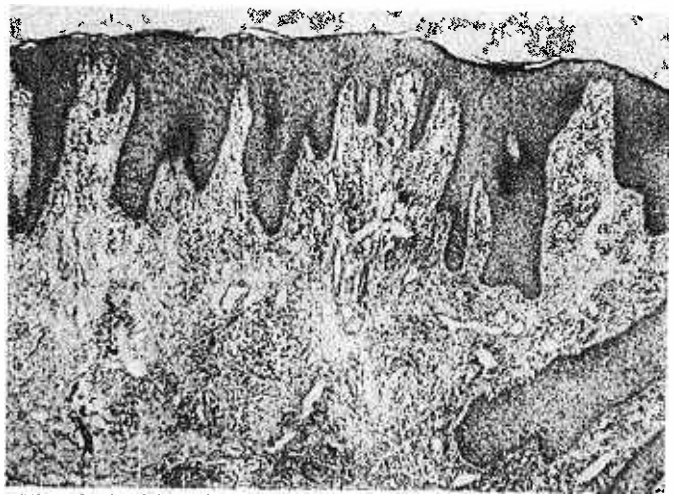

Fig. 2. Epidermis shows pseudoepitheliomatous hyperplasia. A diffuse dense predominently lymphocytic infiltrate with polymorphs and histiocytes occupies the entire dermis. Several dilated vessels are also seen. H & E × 45.

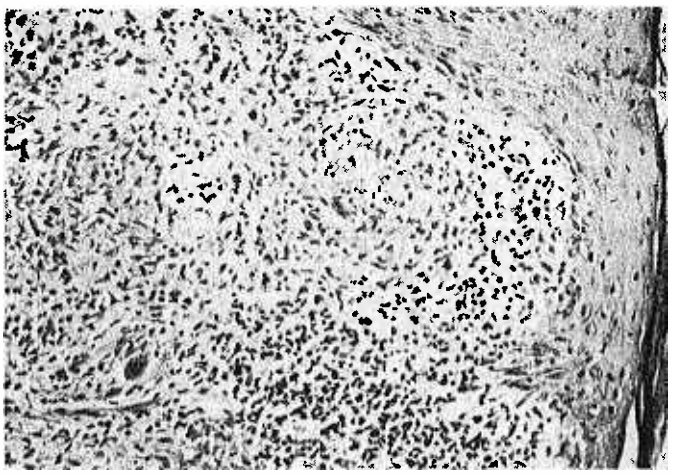

Fig. 3. High power of another portion of specimen in Fig. 2 shows the only tuberculoid granulomas present in the biopsy. H & E × 150.

SEX

There were 17 males to 6 females. The male preponderance has been attributed by Mitchell to the fact that boys more often play in the streets than girls and therefore are more liable to come in contact with infected sputum.

DURATION OF ILLNESS

An interesting feature of the disease was the long duration between the onset of the disease and the time patient seeks treatment. This period varied from 6 months to 20 years. 3 cases were of less than 1 year, 8 between 1-5 years, 7 between 6-10 years and 5 more than 10 years.

Failure of past treatment by practitioners and the asymptomatic nature of the lesion were reasons why patients had philosophically accepted the disease.

SIZE/SITE

Most of the lesions were on the areas such as—buttocks, knees, hands, ankles. These sites of predilection are the areas more liable to be traumatized and act as portal of entry to infected sputum.

The lesions varied from small plaques of 2 cm to large areas covering the whole buttocks as in case 12. The majority were about 4-5 cm.

(b) Lupus Vulgaris

This again is a post primary form of skin tuberculosis. In most cases it arises from a tuberculous condition beneath the surface of the skin either by direct extension or by lymphatic spread e.g. cervical tuberculous adenitis or nasal mucous membrane tuberculosis.

The lesions are thus seen on the head and neck in 90% of cases. A few cases occur on the extremities. Characteristically a flat plaque with

a smooth surface or occasionally scaly surface is seen on the face. It is soft in consistency, reddish brown with areas of scarring. (Fig. 4). Diascopy i.e. pressure with a glass slide will show apple jelly nodules as in the lesions. Histologically tubercle formation is obvious in the upper dermis and a diffuse infiltrate of lymphocytes is seen. The epidermal changes are less pronounced than in warty tuberculosis (Fig. 5).

CASE HISTORY

The one case recorded here (Case 24) was a 4 year old female who presented with a plaque on her (R) elbow, clinically consistent with lupus vulgaris. There was associated suppurative lymphadenitis of the (R) axilla.

(c) **Scrofuloderma**

In this form, a tuberculous process of subcutaneous structure e.g. lymph nodes, ribs, sternum and joints lead to "cold" abscess formation and secondary breakdown of the overlying skin. Ulcers and sinuses form with discharge of watery, purulent and caseous material. The sites involved are usually the neck and the groin and less often the extremities.

CASE HISTORY

This patient, a Chinese male age 42 (Case 25) had concomitant lepromatous leprosy and extensive Pulmonary Tuberculosis. The tuberculous nature of the skin was proven by histology, differential Ziehl-Nielson staining of the bacilli in the discharge as well as in the tissue section and by growth of mycobacteria tuberculosis from the discharge.

A full report of this case has been made elsewhere (Asian Journal of Medicine 1972).

ASSOCIATED PULMONARY TUBERCULOSIS

2 patients had active pulmonary tuberculosis—the patient with scrofuloderma had extensive pulmonary tuberculosis, while case 12 with extensive involvement of the buttocks had minimal active pulmonary tuberculosis.

MANTOUX TEST

In 17 cases, Mantoux test (1 TU of Purified Protein Derivative (PPD) or Old Tuberculin (OT)) was done. It was negative in 5 (induration less than 7mm). In the rest it varied between 8-20 mm and there was no correlation between the size of lesion and Mantoux reactivity.

ERYTHROCYTE SEDIMENTATION RATE (ESR)

The highest erythrocyte sedimentation rate recorded was in the 2 patients with active chest

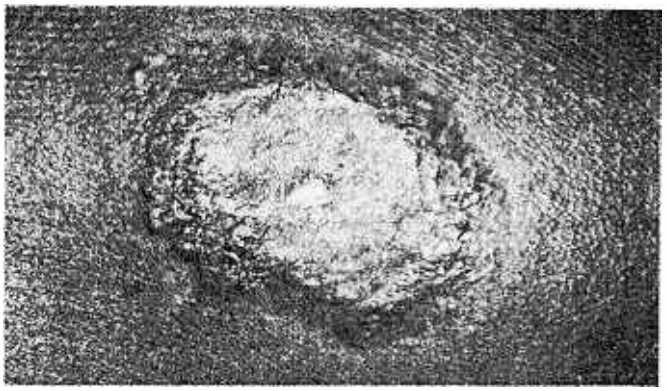

Fig. 4. Lupus Vulgaris of the right elbow (Case 24).

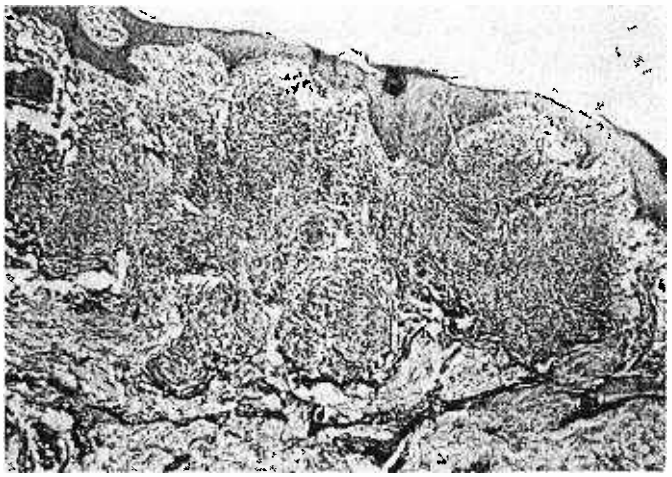

Fig. 5. Several tubercles composed of epithelioid cells and few Langhans' giant cells with surrounding lymphocytes are present in the dermis. A keratinous plug and an acanthotic rete ridge is seen. H Y E × 45.

lesions, 64 and 101 mm in one hour respectively. In the rest who had normal X-ray chest, it varied from 3-42. There again was no correlation between size of lesions and erythrocyte sedimentation rate.

TREATMENT

(a) **Intermittent Therapy**

16 patients with verrucosa cutis were treated by an intermittent regimen of twice weekly high dosage isoniazid and streptomycin. Of these 2 defaulted after one month of treatment and one had side effects due to streptomycin and was given para amino salicylic acid/isoniazid instead (Case 17).

The other 13 responded very well to the intermittent regime and the result of this has been detailed elsewhere (Rajan and Goh). The regime is now the standard treatment for all our new cases.

(b) **Streptomycin/para amino salicylic acid/isoniazid**

8 cases (6 tuberculous verrucosa cutis, 1 scrofuloderma, 1 lupus vulgaris) were treated with all 3 drugs initially—intramuscularly, streptomy-

cin 1 gm, para amino salicylic acid 10 gm and isoniazid 300 mg daily. 1 case defaulted at 3 months because of side effects (Case 15). 4 completed 1 year's treatment with total clearing of lesions and 2 stopped treatment on their own at 6 months and 8 months (Cases 18 and 24) when their lesions had resolved. Case 25 (scrofuloderma) was treated with this regimen but died of drug jaundice.

(c) **Para amino salicylic acid/isoniazid**

2 cases were given para amino salicylic acid/ isoniazid. One of them is case 17 already mentioned. He had good response by four months but stopped treatment on his own at seven months when the lesions had resolved. The other case (Case 12) defaulted after two months of therapy.

DISCUSSION

With the decline of tuberculosis in Singapore, tuberculous cutis is now rarely seen. In contrast, Khoo in 1954 recorded 13 cases in a series of 1,000 skin cases seen over a one year period. Thus tuberculous cutis often goes undiagnosed and should be borne in mind when a patient presents with a solitary recalcitrant skin lesion. In this country, the lesion would be warty looking, of long duration, asymptomatic and situated on a pressure area. Clinical suspicion of a tuberculous aetiology should be supported by biopsy and confirmed by successful therapy with the tuberculostatic drugs. Other disorders can simulate the clinical appearance and must be excluded. Tuberculoid leprosy will show anesthesia and nerve thickening. Deep mycosis, e.g. chromoblastomycoses can be excluded by the presence of spores in the tissue section and culture will grow the fungus (Rajan *et al*). Atypical mycobacterial infection and foreign body granuloma can produce very similar lesions. Histology may not help to differentiate and diagnosis rests on isolating the organisms and on a therapeutic trial of tuberculostatic drugs. Gummata of syphilis can be excluded by specific tests for syphilis and a predominance of plasma cells and vascular changes in the biopsy. Sarcoidosis is almost never seen in this country. The tuberculous reaction is usually weak or negative.

In the Western Hemisphere, lupus vulgaris is the commonest form of tuberculous cutis. However in the East, tuberculous verrucosa cutis is the predominant form (Wong *et al*). This is again confirmed in the series. The infrequency of lupus vulgaris has never been adequately explained. Perhaps the tendency of Asian skin to readily lichenify may be responsible for the preponderance of thickened warty tuberculosis.

Special considerations apply in the treatment of warty tuberculosis and lupus vulgaris. Here the disease is usually limited to the skin, there is high immunity and the bacilli are said to be attenuated. Thus in many centres isoniazid alone has been used with success in the therapy of lupus vulgaris. We have no experience with single drug therapy. Combined therapy with 2 or 3 drugs is indicated where there is a possibility that other organs may be involved. This policy would appear to be sound in Singapore where tuberculosis is still prevalent.

In combined therapy, the patient must discipline himself to daily drug therapy and it is the irregular or negligent patient who relapses. Because of this the intermittent therapy where streptomycin and high dosage isoniazid are given twice weekly under supervision is preferred. Our initial experience with this regimen has been encouraging and this is now our standard treatment for tuberculous cutis. Response to treatment is shown by six weeks, after 3 months of treatment, the lesion is totally flat and at the end of six months only scars are left (Rajan and Goh).

Initially, our policy was to treat patients for up to 1 year but the complete healing clinically by six months prompted us to terminate treatment in subsequent cases at six months, if there is no associated lung tuberculosis. Close follow-up is in progress to see if this policy is wise.

The 2 patients with associated pulmonary tuberculosis were referred to the Chest Hospital (Tan Tock Seng Hospital) for management.

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REFERENCES

1. Clinical Case Studies of Singapore Dermatological Society, Lepromatous Leprosy and Scrofuloderma. Asian Journal of Medicine—Vol. 8, 339, 1972.
2. Khoo O. T.: "Survey of Skin Diseases in Singapore." Pro. Alumni Asso. Malaya—Vol. 7, 18, 1954.
3. Mitchell P. C.: Tuberculosis Verrucosa Cutis among Chinese in Hong Kong.: "British Journal of Dermatology"—Vol. 66, 444, 1954.
4. V. S. Rajan, Y. S. Goh.: "Intermittent Chemotherapy in the Treatment of Tuberculosis Cutis." British Journal of Dermatology—Vol. 87, 270, 1972.
5. V. S. Rajan, B. H. Ong, E. H. Sng, Y. S. Goh.: "Chromomycosis in Singapore." Annals of the Academy of Medicine of Singapore—Vol. 1, 3, 1972.
6. K. O. Wong, K. P. Lee, S. L. Chin.: "Tuberculosis of the Skin in Hong Kong." British Journal of Dermatology—Vol. 80, 424, 1968.