

# "TUBERCULODERMA" A BRIEF REVIEW TOGETHER WITH STATISTICAL ANALYSIS AND OBSERVATIONS.\*

By

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## INTRODUCTION

The dermatologic manifestations of tuberculosis are extremely diverse and early writers described various types without considering the relation of one to the other. In the study and investigations of the lesions of suspected tuberculous aetiology, we have at our disposal clinical history, morphological examination of the lesion, histopathology of biopsy specimen, tuberculin tests and other diagnostic procedures which reveal any evidence of tuberculosis elsewhere in the body. The cultures and inoculation of animals, though useful are not practicable. Cutaneous tuberculosis is not common in our country and all forms seen and described through out the world are not seen or reported. Classification is difficult as members of one group sometimes present characteristics of another group,

## HISTORICAL

Tschening reported in 1888 primary tuberculous complex of skin in Europe and Chancellor in 1914 in America. Wien and Cornbleet (1927) described a case of inoculation tuberculosis of skin simulating sporotrichosis and similar lesions have been described by Simpson in 1928. Fischl (1930), Holt (1913) and Wolff (1921) dwelled on the subject of external infections in general in children and Koch Herbert (1919), Siegl (1933) and Dunken (1927) elaborated on the subject of primary tuberculous complex and made contributions in the field. The postmortem wart was first proved to be tuberculous in 1884 and it was termed *Verruca necrogenica* by Wilks in 1886. Riehl and Paltauf in 1886 described a variety of verrucous tuberculosis due to inoculation from without. Forchammer in his studies from 1896 to 1906, made observations on the anatomical sites of affection of lupus vulgaris. Leloir (1891) described a variety of the disease called lupus vulgaris erythematoides.

Darier in 1896 made a classification of tuberculous diseases of skin and named the tuberculides in a separate group. Michaelson in 1924 described scrofulous gummata and gave a good clinical and histological report of cases, together with literature on this form of scrofuloderma. Riehl presented a group of cases under the title "*Tuberculosis fungosa cutis.*" Tuberculous ulcers, which once were supposed to be the sole manifestation of cutaneous tuberculosis, were described by Kaposi, Jarish, and Chiari in 1879. Oculy and Montgomery in 1950 described Lichenoid tuberculides, Tulbury Fox, the military lupus of the face, Crocker the acne agminata, Barthelemy, the acnitis and Hohmann in 1947 described the initial erythematous tuberculide of the face.

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Griffith (1916 to 1922) has established, after a series of extensive investigations, that the tubercle bacillus in lupus vulgaris is of attenuated virulence. These results were confirmed by Frimodt-Müller in 1936.

French investigators, mindful of the beneficial action of the sunshine used Vitamin "D" and found it useful in some forms of tuberculosis. This train led Charpy (1943) to use Calciferol in a series of patients with lupus vulgaris. Dowling and Thomas independently in England, treated (1946) cutaneous tuberculosis with Calciferol. Fieldman and Hinshaw (1944) investigated the use of streptomycin in tuberculosis; later the same author with O'leray and Ceder reported on the use of this drug in various forms of cutaneous tuberculosis. Dowling and Weddington, Russel and Thorne reported the progress of patients treated with isonicotinic acid hydrazide.

### CLASSIFICATION

The purpose of the classification is to afford the physician an adequate basis for a correct prognosis for a given tuberculoderma as well as to aid in the proper management of the individual case. There has been a great difficulty in forming arbitrary classifications with sharply drawn distinctions between various forms of tuberculodermas. Observations showed that patients often had more than one form of tuberculosis at the same time and this created interest in their relationship and efforts were made to find a corner stone on which a suitable classification could be built. The mode of infection, morphologic features, histopathologic findings, the course of the disease and the immunologic status are being considered as the basis for any attempted classification. Bacteriologic observations except for a few types of cutaneous tuberculosis are not of a great help in forming a classification.

The classification of tuberculous disease of the skin proposed by Darier in 1896 has undergone little alteration during the present century. Darier divided the cutaneous manifestations of tuberculosis into two groups, those in which the tuberculous cause can be plainly established by the demonstration of the tubercle bacilli in the lesions and by infecting experimental animals with the diseased tissue, and those which failed to satisfy such absolute criteria. On the otherhand the second group satisfied other criteria so often that a direct relationship with tuberculosis might be supposed to exist; particular importance was attached to histological structure and co-existence of tuberculous disease elsewhere. The first group he named as True Tubercloses; in the second group he included a number of well defined and well known dermatoses of eruptive type under the name of Tuberculides. A few dermatoses tentatively classed as tuberculides by Darier are now excluded, notably lupus erythematosus and granuloma annulare and one, the Rosacea-like tuberculide of Lewandowsky has been tentatively added to the list. In addition, erythema nodosum though not included in the established list of tuberculides, is sometimes an early manifestation of tuberculosis and Hofmann

(1947) described under the name of “initial erythematous tuberculide” an erythema-multiform like eruption, sometimes associated with erythema nodosum which he observed in Holland in a number of cases of primary infection of the lung.

As matters stand the full list is as follows :

### THE TRUE TUBERCULOSES

1. The primary tuberculous complex of skin.
2. Lupus Vulgaris.
3. Tuberculosis verrucosa cutis.
4. Scrofuloderma or Colliquative tuberculosis.
5. Tuberculosis ulcerosa.

### TUBERCULIDES

1. Lichenoid Tuberculides (Lichen scrofulosorum or tuberculosis Lichenoides) (Okuly and Montgomery 1950).
2. Papulonecrotic Tuberculides. (which include folliclis and acneform tuberculide)
2. Miliary lupus of the face (Tubery Fox) acne agminata (Crocker) acnitis (Barthelemy).
4. Hypodermic tuberculides; indurative erythema of lower extremities of Bazin and some add-erythema nodosum of tuberculous origin,
5. The initial erythematous tuberculide of Hohmann.
6. The Rosaceous tuberculide of Lewandowsky (micropopular tuberculide of the American authors).

This classification has been criticised by Bolgert and Levy (1950) on the basis that this suggests a sharp distinction in pathogenesis between the two and they proposed a classification which is based on anatomical structure and which emphasises the variety of possible modes of reaction of the skin to the presence of tubercle bacillus or its products.

### PATHOGENESIS

The pathogenesis of skin tuberculosis is essentially the same as that for tuberculosis in general and all forms are produced by the local action of the bacillus or its products. The skin forms an unfavourable situation for the thriving of the tubercle bacillus. The intact integument is not pervious to the bacillus and infections taking place from outside occur only through the injured skin; otherwise the infection mostly occurs as an endogenous superinfection. It occurs by contiguity from underlying lymph nodes, bones and joints or by metastasis through the blood and lymph streams. The primary tuberculous complex and warty lupus comprise the inoculation form of tuberculosis while scrofuloderma and the various tuberculides are usually endogenous in origin. The state of allergic or immune

reactions and the virulence and the type of bacillus determine the clinical manifestation of a particular tuberculoderma. The race and the age of the individual also contribute to some extent.

### BACTERIOLOGY

The causative organism is *Mycobacterium tuberculosis* and in the so called true tuberculoses, it is found in varying numbers in the lesions and the animal inoculations are successful. In the other forms it is only found in the earliest stages before the true clinical and histological picture has developed. As the skin is exposed to the outside environment with all its variations in temperature and other physical factors, the bacillus gets attenuated during its long abode in the skin. The tubercle bacilli isolated from lupus lesions in several patients are found to be of attenuated virulence by Griffith and others. Mollers studied the relative frequency of the human and bovine type of bacillus in the lesions and found that in lupus vulgaris it worked out to be 72.6% and 27.4% and in infections of cervical and axillary lymph nodes 75.3% and 24.7% respectively. Thus it is the human type that is the infective agent in a great number of cases of skin tuberculosis.

### MATERIAL

Patients suffering from tuberculous affection of skin, drawn from the Northern Districts of Andhra Pradesh are selected for this study. Case records of the King George Hospital for eight years from 1951 to 1958, comprising of 336 cases of tuberculosis of the skin are analysed and discussed with regard to the incidence, type, age, sex etc. and the observations recorded.

### METHODS

The diagnosis of the various forms of tuberculoderma was made clinically at first and then was confirmed by histological examination. The microscopic diagnosis confirmed the clinical diagnosis in all the cases cited in the present series. It is very difficult to demonstrate the bacilli by cultural methods in skin tuberculosis and hence no attempt is made in this regard. Routine clinical examination of the typical morphological features often enabled use in the diagnosis. An attempt was made to locate any distant tuberculous focus either in the lungs or in the bones etc. and Roentgenograms were taken in most of these cases. Where the x-ray was not possible fluoroscopy of the chest was done. The blood sedimentation rate, intracutaneous tests with P. P. D. and sputum examination for acid fast bacilli were done in all cases for supporting the diagnosis. A detailed history was taken in each patient to illicit any evidence of contact with an open case. Autopsy and detailed histological examination was made in one case.

### STATISTICAL ANALYSIS AND DISCUSSION

The 336 patients comprising the present material consist of mainly the active cases seeking the medical advice and attention for the first time in the hospital. About half of them have come under the personal observation of the writer during

his stay in the King George Hospital, Visakhapatnam since 1956 and the rest of are taken from the hospital records since 1951. The majority of these patients are from the Northern Districts of Andhra Pradesh. The general economic level at the time of study is low; the average wage of a labourer is small and housing is often inadequate and many families are grossly overcrowdēd.

The duration from the onset of the disease to the time of their attending the hospital is very prolonged in the majority of the patients. It is particularly so in cases of lupu vulgaris and tuberculosis verrucosa cutis. In cases of scrofuloderma it is ranging from six months to one year in many cases while in other types it has even exceeded two years and more.

INCIDENCE

The incidence of the tuberculosis of the skin of various forms in relation to the total number of skin cases attending the skin out patient department is as follows :

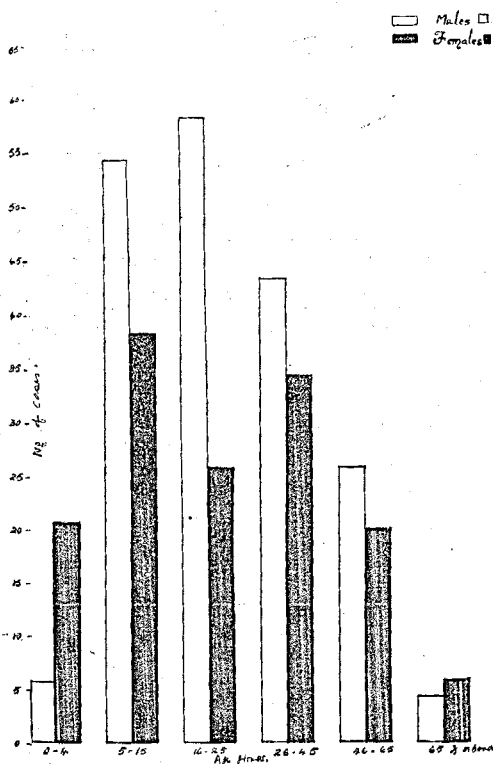
	Total No of skin cases treated from 1951-1958	Total No. of skin tuberculosis 1951-1958	Percentage
Males	73,800	191	0.26% or (2.6/1000)
Females	63,100	145	0.23% or (2.3/1000)
Total	136,900	336	0.24% or (2.4/1000)

Thus it is seen that the incidence of the disease is between 0.23% to 0.26% (2.3 to 2.6 in 1000 cases) of the total that attend the skin department. This is in conformity with the previous reports on this subject published from West Bengal and Andhra. The incidence of tuberculosis of the skin in the tropics is considered to be very low when compared to the Western countries where they recorded 1 to 2%.

The data regarding the non-pulmonary forms of tuberculosis as available from the chest clinic from 1951 to 1958 is as follows :

Year	No. of cases of pulmonary tuberculosis	No. of cases of non-pulmonary tuberculosis	No. of cases of skin tuberculosis out of the non-pulmonary cases
1951	1149	235	28
1952	1238	233	53
1953	1454	274	42
1954	1350	271	21
1955	1213	392	45
1956	1228	352	54
1957	1874	224	43
1958	1620	275	50
Total	11,126	2,256	336 (15% of non-pulmonary tuberculosis)

It is seen from above that 2,256 cases of non-pulmonary tuberculosis were diagnosed as against 11,126 cases of pulmonary tuberculosis. Out of these 2,256 cases of non pulmonary tuberculosis 336 cases suffer from tuberculoderma of all types; thus 15% of non pulmonary tuberculosis constitute the tuberculosis of the skin. The above data are based upon the statistics available from the chest clinic from 1951 to 1958 and the figures of the skin department are correlated with them. Notification of tuberculosis by Private Physicians is not in practice in this country and hence the material available in the form of patients in the outpatients clinic cannot represent a true cross section of the population of the districts. Further due to the chronic and relapsing nature of the disease majority of the patients from the muffsil do not seek medical aid and hence the true incidence of the disease tends to be a little more than what is represented from the hospital statistics.



DISTRIBUTION BY AGE

The age at the time of the first visit of the patient to the out-patient clinic is as follows :

Age	Male	Female	Total	%
0—4	6	21	27	8.00
5—15	54	38	92	27.39
16—25	58	26	84	25.00
26—45	43	34	77	22.92
46—65	26	20	46	13.69
65 and above	4	6	10	3.00
Total	191	145	336	100.00

The majority of cases occurred between the ages of 5 and 15 amounting to 27.39%.

#### DISTRIBUTION BY SEX

One hundred and ninety one (56.8%) patients were males and one hundred and forty five (43.2%) females. The preponderance of males is statistically significant. It is absolutely and relatively greatest at 6–25 years as shown in the histogram. We could attribute no particular predisposing factor for higher incidence in the male, barring that they run greater risk of sustaining injury, most of the patients being labourers.

#### TYPES RECORDED

The incidence of different types of skin tuberculosis from 1956 to 1958 is as follows:

Primary tuberculous complex of the skin	...	...	1
Lupus vulgaris	...	...	74
Tuberculosis verrucosa cutis	...	...	20
Scrofuloderma	...	...	39
Tuberculosis ulcerosa	...	...	2
Verruca necrogenic	...	...	1
Erythema nodosum of tuberculous origin	...	...	1
Rosaceous tuberculide	...	...	1
			147

Thus it is seen that about half or more of these cases constitute the classical lupus vulgaris, while scrofuloderma takes the next place in order of frequency. The diagnosis of rosaceous tuberculide in the case (Fig. 1) cited above is made both clinically and histologically and in this multiple tuberculomata in the brain were seen on autopsy in which the acid fast bacilli were present. (The case already reported in one of the previous Journals of Indian Association of Dermatologists and Venereologists). The one case, which was diagnosed to be primary tuberculous complex of the skin, (Fig. 2) started with irritation and redness of the conjunctiva and ulceration of the external canthus of the left eye with swelling of the preauricular lymph node. Mantoux test was positive in this case by the



Fig. 1



Fig. 2



Fig. 3



Fig. 4



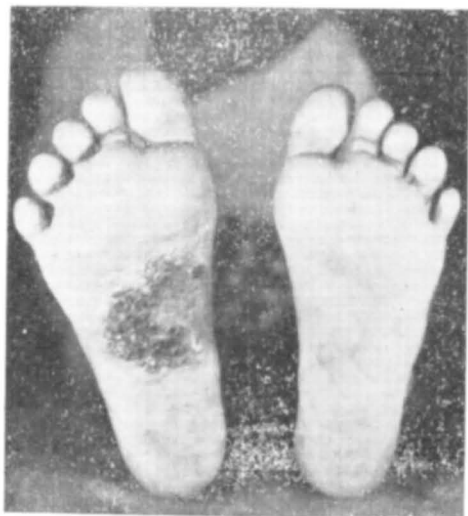


Fig. 5

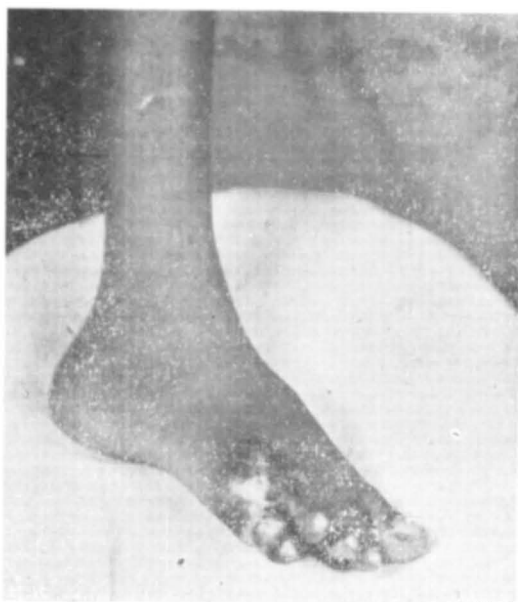


Fig. 6



Fig. 7



Fig. 8

time the patient attended the clinic for medical advice. The case of verruca necrogenica in the series is observed on the inner side of the volar aspect of the right thumb in the assistant Pathologist working in this institution. He was handling and doing postmortem examinations in the department and this is a typical example of accidental inoculation with mycobacterium tuberculosis. The single case of erythema nodosum is a boy of 4 years. He attended the clinic with history of fever and painful swellings on the extensor surface of both the legs and on x-ray examination of the lungs fields revealed a primary tuberculous complex in the right apical region with typical mediastinal lymph node enlargement. This is the only case of erythema nodosum where a tuberculous aetiology was confirmed, while there are many where the causative factor was otherwise. This case clearly illustrates and confirms the theory that erythema nodosum of tuberculous aetiology is usually common in primary tuberculous complex wherever it may occur.

#### LUPUS VULGARIS

The cases of classical lupus vulgaris showed great variation in their morphological features. A majority of the 74 cases observed in three years are hypertrophic lesions (Fig 3) with exuberent proliferative growths at the active margins. Out of these, six cases are of the circinate type with scarring at the centre and spread at the periphery. The less frequent ones are the crusted type and they were seen mostly in those involving the face. (Fig. 4) The cases of lupus hypertrophicus showed a tendency of thick, scar formation which was usually corded and band-like. In greater number of cases the extremities were involved.

The distribution of the lesions is as follows:—

Face and Neck	...	...	...	16
Trunk	...	...	...	7
Extremities	...	...	...	51
			Total	74

This illustrates that the preponderance of the disease is not over the face as is seen in the Western countries. Panja and Benerjee drew attention to the strikingly high incidence of tuberculosis cutis over the limbs and the observations in this hospital coincide with those in West Bengal. A number of these cases on "interview study" give history of some initial trauma over the part affected. One has to take this as a predisposing factor to account for the high incidence of lupus vulgaris on the extremities.

#### WARTY LUPUS

The verrucous or Warty type of tuberculosis of the skin (Figs. 5, 6 & 7) is also quite common as indicated in the chart. Out of 147 cases of all types observed during 1956-58, 26 cases were of tuberculosis verrucosa cutis forming 19% of the total cases of tuberculoderma observed in the series. In most of these cases they

are usually single, not exceeding a few centimeters in size and of very prolonged duration. More than half of these cases occurred near about feet and in two cases they are confined to the planter aspect of the feet. In one case the palmar aspect of the hand was affected in addition to two small lesions on the dorsal aspect of the hand.

### SCROFULODERMA

39 cases out of 147 in the series were diagnosed as scrofuloderma. They stand second in order of frequency (as mentioned earlier) comprising 26.5%. Most of these cases occurred as a result of tuberculous lymph adenitis which underwent caseation and abscess formation. In a few cases the presternal (Fig 8) area was the site of affection while in one case the mandible was affected on the right side, (Fig. 9) The usual course of the disease was, spread from one group of lymph nodes to another over a period of months or years. Regression in one place followed by progression in a new focus, and lymph nodes in which tuberculosis had become apparently quiescent suddenly showed signs of renewed activity by softening and breaking down. In some cases extension to other lymph nodes was found in distant situations with only remote anatomical connections and even on the opposite side of the body

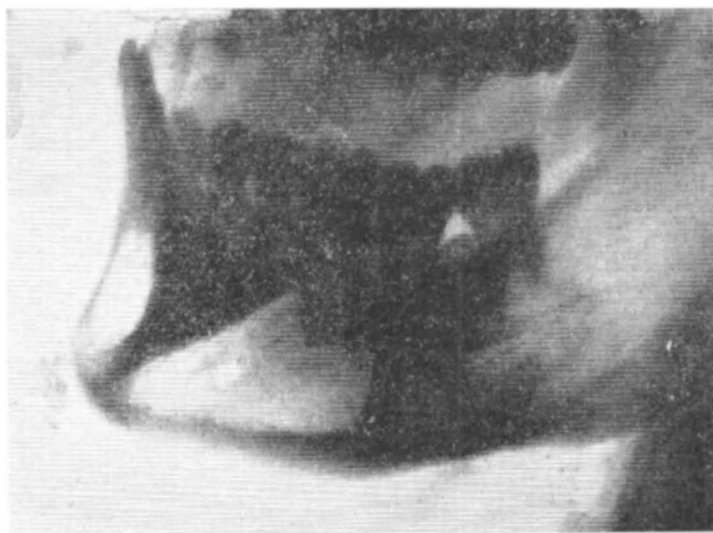


Fig. 9

According to the terminology adopted, the seventeen cases displayed, upto the time when observation ceased, scrofuloderma of ten anatomically distinguishable groups of peripheral lymph nodes. From the table where these are enumerated, below it is clear that by far the commonest situation was the neck and axillae and that the upper cervical group was involved more frequently than the other groups.

The total lymph node groups involved resulting in scrofuloderma.

Group	Right	Left	Bilateral	Total groups
Preauricular	1	1	—	2
Deep cervical	13	6	2	21
Posterior midjugular	2	1	1	4
Sub-maxillary	2	1	—	3
Supraclavicular	2	1	1	4
Submental	2	1	—	3
Axillary	2	3	3	8
Inguinal	1	2	1	4
Popliteal	—	—	—	—
Epitrochlear	—	1	—	1

Considering each case individually the writer is impressed with the repetition of certain clinical patterns, the successive occurrence of swelling and breaking down in lymph nodes adjacent or anatomically associated which seemed to indicate well defined paths of spread by anatomically recognised lymphatic channels and this sequence occurred in many cases to justify the pathogenic deductions. As the disease progressed healing also took place in a similar sequence, the nodes last affected being the last to heal. (Fig. 10) The very high proportion of cases in



Fig. 10

which the upperdeep cervical group was involved is an indication, by reason of its anatomical connections, of the great importance of the nasopharynx as the portal of entry for tuberculous infection. The axillary group stands next in order of

frequency. Lupus vulgaris developed along the edges of the scrofulous ulcers in seven cases. (Fig. 11).



Fig. 11

### THE ERYTHROCYTE SEDIMENTATION RATE IN SKIN TUBERCULOSIS

The E. S. R. was done by Westergren's method in 39 cases of all types. It is observed that the sedimentation rate was raised markedly in cases of scrofuloderma than in other types. It ranged from 30 mm/hour to 134 mm/hour; whereas in cases of lupus vulgaris it ranged from 12 mm/hour to 46 mm/hour. The E. S. R. was the lowest in cases of tuberculosis verrucosa cutis in which it ranged from 8 to 19 mm/hour.

There is no marked fall after treatment in the sedimentation rate in cases of lupus vulgaris and the average fall in cases of scrofuloderma was 3.2 mm/hour in a month. A raised sedimentation rate out of proportion to the scrofulous lesion raised the suspicion of continued activity of the focus.

### THE MANTOUX TEST

It was positive in all cases. It ranged from 8-22 mm and in two cases the reaction was very severe and ulceration supervened and particularly so in the case of erythema nodosum of tuberculous origin.

## INVOLVEMENT OF A DISTANT FOCUS

Out of the 51 cases of all types of tuberculoderma studied in the series tuberculosis was established at a distant focus in 11 cases as shown below :

Pulmonary tuberculosis	...	...	9 cases
Involvement of bone	...	...	1 "
Tuberculoma of the brain	...	...	1 " (Fig. 15)

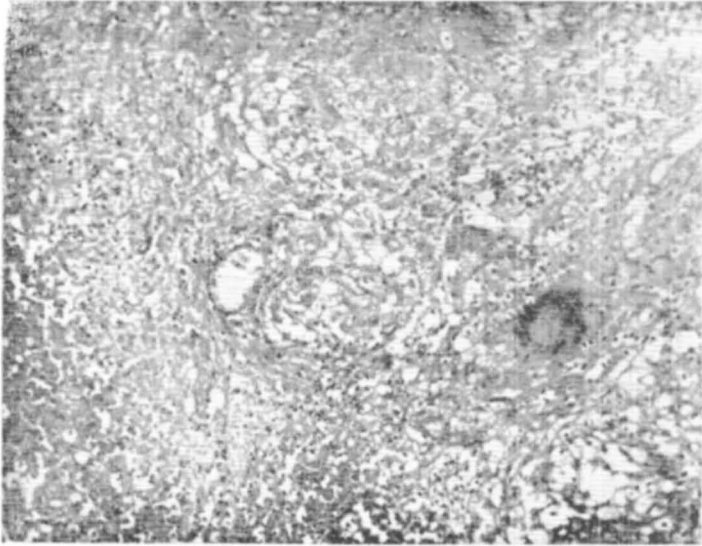


Fig. 15

Thus 18% of these cases showed pulmonary involvement.

## MULTIPLICITY OF THE LESIONS

Out of 34 cases of all types enumerated 23 cases showed only single isolated lesions and 11 cases had multiple lesions. The lesions are multiple in most of the cases of scrofuloderma whereas they are single and isolated in a majority of cases of lupus vulgaris and Warty lupus. An effort is made to trace the source of infection in the patients and out of the 34 cases studied in the series 9 cases gave history of previous trauma at the site of the lesion resulting in inoculation tuberculosis. One of the cases showed a patch of tuberculoid minor variety of leprosy on the right knee while he had lupus vulgaris of the front of the abdomen. This is the only case where tuberculosis of the skin and leprosy coexisted.

## AN ASSESSMENT OF THE TREATMENT AND PROGRESS

Owing to the chronic and relapsing nature of the disease it was not possible to apply an equal observation period in all cases though this factor of variation has some bearing on the results. Lupus vulgaris treated with Calciferol alone showed signs of initial inflammatory reaction followed by regression of the lesion to a

varying degree. They did not attain a complete cure with calciferol alone. Some residual activity remained in the patches as shown by the round cell infiltration and the presence of epithelioid follicles in the sections. Calcium deposits were not found on a second biopsy.

Observation of progress in 8 patients treated with streptomycin and isoniazid for periods varying between 8 and 32 weeks were made. After clinical cures by this therapy, a second biopsy in some revealed the presence of tubercles in apparently healed scars. ( Fig. 4 & 12 ).



Fig. 12

Local injections of small doses of isoniazid resulted in marked reduction in the elevation of the proliferative margin and the healing process took place with much less scarring as shown in figure No. 13 at the arrow and Fig. 14.

Ultra violet irradiations to the part showed no marked change in the series observed. But local application of the picric paste containing copper sulph 85%; Zinc sulph 14% and Picric acid 1% helped considerably as a selective caustic. Superficial x-ray exposures were tried in cases of scrofuloderma, simultaneously with treatment by streptomycin and isoniazid. This helped considerably in the healing process of the lesion.

#### SUMMARY AND CONCLUSIONS

1. A brief review of the tuberculosis of the skin with regard to classification, pathogenesis and bacteriology is made.
2. A statistical analysis of the hospital records for 8 years comprising of 336 cases is made and various aspects discussed.

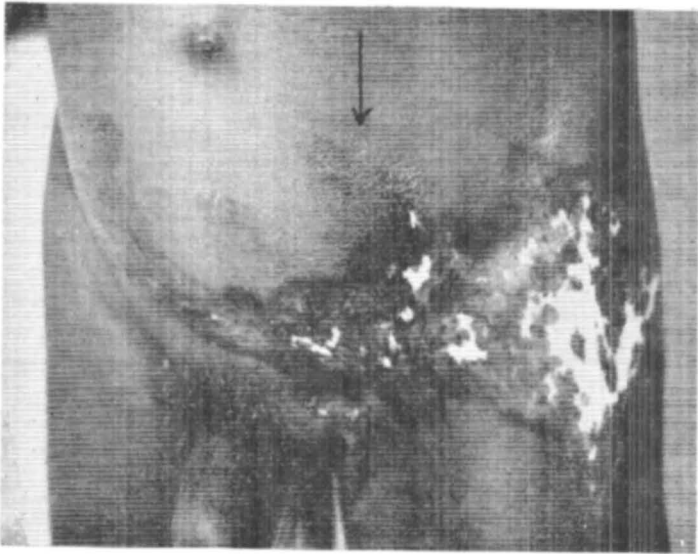


Fig. 13



Fig. 14



3. It is shown that although skin tuberculosis is rare in the tropics, it forms a fairly good proportion of the non-pulmonary tuberculous affections.
4. The need to spot primary foci of tuberculosis which account for the cutaneous lesion is emphasized.
5. It is shown that in the inoculation type of tuberculosis trauma is most often the predisposing factor.
6. The study exemplifies the fact that face is not the common site of affection in lupus vulgaris in the tropics.
7. The poor results of local treatment are completely transformed when intra-lesional infections of I. N. H. are given along with the other forms of treatment.

#### ACKNOWLEDGEMENTS

1. My thanks are due to the Superintendent, King George Hospital, Visakhapatnam for his kind permission to utilise the hospital records.
2. I am deeply indebted to Prof. K. C. Kandhari of the All India Institute of Medical Sciences for his valuable guidance and helpful suggestions in bringing out this article.

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