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**Staff Meeting Bulletin  
Hospitals of the » » »  
University of Minnesota**



**Erythema Induratum**

STAFF MEETING BULLETIN  
HOSPITALS OF THE . . .  
UNIVERSITY OF MINNESOTA

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during the school year, October to June, inclusive.

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William A. O'Brien, M.D.

I. LAST WEEK

Date: February 19, 1943

Place: Recreation Room,  
Powell Hall

Time: 12:15 to 1:25 p.m.

Program: "Acute Meningitis"  
H. Alway  
Erling S. Platou

## Discussion

Erling S. Platou  
Wesley W. Spink  
Irvine McQuarrie  
Captain Hans Schwyzer (MC)

Attendance: 118

Gertrude Gunn,  
Record Librarian

- - -

II. MEETINGS1. ANATOMY SEMINAR

Saturday, February 27 at  
11:30 a.m., in room 226 Institute of  
Anatomy.

"Observations on a Central Adrenal Path-  
way in the Rabbit,"

Robert L. Merrick

"Sex Hormones and the Modification of  
Genital Structures,"

Leslie Reed

- - -

2. PHYSIOLOGY-PHARMACOLOGY  
SEMINAR

Tuesday, March 2 at 4:30 p.m.  
in room 214 Millard Hall.

Subject to be announced.

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3. BACTERIOLOGY SEMINAR

Thursday, March 4 at  
4:30 p.m., in room 214 Millard Hall.

"Microbial Thermogenesis,"

John Ulrich

- - -

### III. ERYTHEMA INDURATUM

W. G. Fredericks

#### Definition

Erythema induratum is a chronic, recurring disorder of the skin and the underlying subcutaneous tissue. It is tuberculous in origin. It is usually found on the legs and is characterized by deeply situated nodosities and ulcerations.

#### Synonyms

Erythème induré des scrofuleux, Bazin's disease, and tuberculosis cutis indurativa.

#### Historical development of etiologic concept

The question of the tuberculous or non-tuberculous origin of erythema induratum has been debated for many years. Ernest Bazin,<sup>1</sup> the great French dermatologist of whom it was said "described all or almost all of the existing skin diseases," was the first to recognize this condition clinically in 1861 and considered it a form of tuberculosis of the skin.<sup>2</sup>

J. C. White, one of the foremost American dermatologists,<sup>3</sup> distinguished erythema induratum clinically from erythema nodosum in 1894.<sup>4</sup> However, he missed the relation of Bazin's disease with tuberculosis.

Audry in 1898 gave the first detailed account of a histologic study of erythema induratum<sup>5</sup> but thought the disease was non-tuberculous, a relapsing ulcerating type of erythema nodosum.

Later in 1898 Leredde stated that erythema induratum was a tuberculid and noted that the pathologic changes were maximum in the subdermic tissue and intimately associated with blood vessels.<sup>6</sup>

Dade in 1899 also differentiated erythema induratum clinically from erythema nodosum<sup>7</sup> and considered the condition non-

tuberculous. From a histologic study of a biopsy from Dade's patient, Ewing classified erythema induratum as a sub-acute exudative inflammatory process.

Johnston in 1899 said that if the condition was tuberculous it was so in the sense that it was produced by the toxins of the bacilli<sup>8</sup> rather than by the bacilli themselves. He considered it a non-microbic inflammation of the hypoderm.

Thibierge and Ravaut in 1899 proved that a case of erythema induratum was tuberculous by guinea pig inoculations<sup>9</sup> and suggested that the disease was embolic in origin. However, they did not see tubercle bacilli on histologic examinations of sections.

T. Colcott Fox in 1900 confirmed the work of Thibierge and Ravaut by guinea pig inoculation.<sup>10</sup> He felt that feeble peripheral circulation was often a notable feature.

Macleod and Crmsby described the histopathology of erythema induratum in great detail in 1901.<sup>11</sup> They found tubercle bacilli in only 1 out of 70 stained sections from an excised lesion of one patient. In both of the two patients cited the earliest pathological changes were in the hypoderm.

Whitfield in 1901<sup>12</sup> and again in 1905<sup>13</sup> theorized that there were two types of erythema induratum: one a true tuberculous condition and a second non-tuberculous condition which occurred in older patients, was more painful, had a more rapid course, and less tendency to ulcerate. In 1909<sup>14</sup> he reviewed cases which he called multiple inflammatory nodules of the hypoderm, again dividing them into the true erythema induratum type of tuberculous origin and the non-tuberculous type. Drawing from the work of Flemming, Heitzmann, and Marchand he concluded that all kinds of inflammatory atrophy of fat may be associated with an infiltration of a histological picture similar to that of erythema induratum.

Many cases of erythema induratum have been reported since, and the controversy

of tuberculous versus non-tuberculous origin continues. However, erythema induratum as under discussion today is considered only tuberculous in origin.

#### Relation of Erythema Induratum to other forms of Tuberculosis Cutis

Various classifications of tuberculosis cutis have been made. In general these classifications have followed Jadassohn,<sup>15</sup> Gans,<sup>16</sup> and Sweitzer<sup>17</sup> and divide Tuberculosis cutis into first, the type which spreads by local extension, and second, the type which spreads by hematogenous or lymphogenous route. In the former are included primary cutaneous tuberculosis, lupus vulgaris, tuberculosis verrucosa cutis, and scrofuloderma. In the latter are included acute miliary tuberculosis with involvement of the skin, the tuberculids, and erythema induratum.

Michelson classifies tuberculosis cutis on the basis of its clinical course.<sup>18</sup> Based thus on prognosis there is the type which tends to heal spontaneously. Here erythema induratum is found, but, though healing can be expected, it is classified among those that heal slowly. The course of scrofuloderma is also that of slow healing. Tuberculids and tuberculosis verrucosa cutis heal more readily. Lupus vulgaris is found in the chronic or progressive type, miliary tuberculosis in the fatal type.

Possibly in the future a classification following the work of Florence Sabin<sup>19</sup> and based on the histopathology of the tissue reaction to lipoids, proteins and other fractions of the tubercle bacilli will clarify the concept and understanding of cutaneous tuberculosis,

#### Clinical picture and course of erythema induratum

One of the best clinical descriptions of erythema induratum was that of T. Colcott Fox<sup>10</sup> who listed four striking features of the nodosities:

- (1) begin in the hypoderm of the legs.
- (2) successive formation over months or years
- (3) extreme indolence
- (4) undergo regression with atrophy or ulcerate and discharge puriform contents.

The early lesions are felt before they are seen. They are indurated and usually confined to the legs, particularly the calves. The redness, deepest in the center, fades insensibly to the normal color of the skin at the border. The nodules are weeks in developing and months in healing. Central softening of the lesions may occur producing ragged ulcers with a thin, sometimes blood tinged, purulent discharge. Slow regression without ulceration may occur. Pigmentation is a common sequel to involution. Scarring usually results whether ulcerations occur or not. The lesions may persist for years. Successive attacks may occur over years. Hence, at a given time there may be nodules, ulcers, and atrophic scars.

#### Clinical differentiation of Erythema induratum from other inflammatory nodules of the skin and hypoderm

Differentiation from erythema nodosum<sup>20</sup> constitutes the most common problem in the diagnosis of erythema induratum. As mentioned before, the course of erythema induratum is that of weeks in developing, months in healing, and at times relapses or recurrences during the winter for many years. The course of erythema nodosum is that of an acute disease. Its nodules may appear, persist for 2 or 3 weeks, and then disappear spontaneously. The nodules of erythema induratum are more uniform in size and more deeply situated. The calves are the most common site of the lesions of erythema induratum, whereas the extensor surfaces of both the arms and the legs, particularly the shins, are the usual location of the lesions in erythema nodosum. In the acute phase the colors seen in erythema nodosum are more

brilliant than those of erythema induratum. In the former there is a play of colors from bright red to dark red and purple. The lesions of erythema nodosum are much more painful and tender. Constitutional symptoms such as fever, joint pains, and malaise usually precede and accompany the cutaneous lesions of erythema nodosum, but are absent or only mild in erythema induratum. The nodules of erythema nodosum never ulcerate whereas the lesions of erythema induratum commonly soften and break down. Sunken cicatrices usually follow the healing of the lesions of erythema induratum. Only greenish or brownish stains follow the nodules of erythema nodosum and disappear after several days. Not infrequently other forms of tuberculosis, such as tuberculids, adenitis or pulmonary lesions are found associated with erythema induratum. According to some, the combination of the lesions described previously as typical for erythema induratum and the presence of tuberculosis elsewhere make the diagnosis of erythema induratum certain even though the histologic picture of the biopsied lesion is not tuberculosis in the classical sense. The prognosis of the patient with erythema induratum is good with regard to life expectancy compared to other forms of tuberculosis. At times the lesions of erythema nodosum have proved to be the first outward sign of tuberculosis, appearing only 3 to 8 weeks after the tuberculous infection took place. Erythema nodosum may also appear at the time of an exacerbation of tuberculosis elsewhere. Usually, however, no evidence of active tuberculosis is found associated with erythema nodosum. The lesions of erythema induratum are resistant to treatment as a rule, whereas those of erythema nodosum heal and disappear readily with bed rest.

Nodose-like sulfa eruptions because of their similarity to erythema nodosum may enter into the differential diagnosis of erythema induratum.<sup>20</sup> The history of antecedent drug ingestion as well as the acuteness of the eruption distinguishes this condition readily from erythema induratum. Concomitant constitutional symptoms such as fever and malaise are seen. Prompt disappearance of the erup-

tion usually follows discontinuance of the sulfa drug.

A gummatous syphiloderm must be ruled out in the diagnosis of erythema induratum.<sup>21</sup> In the former the lesions are solitary or a few, hence asymmetrical.<sup>22</sup> In the latter the lesions are multiple and usually symmetrical. Gummatous ulcers found on the legs are most frequently situated on the upper two thirds, especially the anterior and outer aspects. Their onset is more rapid than the lesions of erythema induratum. Their disappearance quick in response to specific antisyphilitic therapy. Untreated, the lesions are indolent. They are "punched out" in appearance, round or oval in contour, deep, and have a purulent base. The arciform configuration, both in the individual lesion and a group of lesions is a striking characteristic of these syphilitic lesions. The blood Wasserman test is positive. As mentioned earlier, the ulcers of erythema induratum are ragged and the lesions are typically located on the calves. There is no characteristic configuration. No recurrence in the scar of an old healed syphiloderm is seen. In erythema induratum recurrences in old healed scars is not uncommon.

Necrobiosis lipoidica diabetorum<sup>23</sup> and the subcutaneous nodules of sarcoidosis<sup>24</sup> may be differentiated readily from erythema induratum. The lesions in the first-mentioned are waxy plaques yellowish at the center and violaceous at the periphery. Tangiectatic blood vessels traverse the surface of the lesions. Necrobiosis lipoidica diabetorum, it is generally believed, is directly connected with diabetes mellitus. A high percentage of the cases reported have occurred in patients with that disease. Though the cutaneous lesions of sarcoidosis may involve practically all parts of the body, the face is the site of predilection. The Mantoux test must be negative to fulfill the customary diagnostic criteria of sarcoidosis. In erythema induratum the Mantoux test is strongly positive. The roentgenographic changes in the lungs, fingers, and toes frequently aid in the

diagnosis of sarcoidosis.

Subcutaneous nodules, not infrequently found in periarteritis nodosa,<sup>25</sup> may be difficult to distinguish clinically from the nodules of erythema induratum. In the former the nodules may be single or multiple and are found along the course of a superficial artery. Irregular fever, muscle pain, and signs of peripheral neuritis may suggest the diagnosis. The general picture in periarteritis nodosa is that of a subacute illness with remissions and acute exacerbations. Eosinophilia is commonly present.

Nonsuppurative panniculitis,<sup>26</sup> a rare disease, may also be difficult to distinguish from erythema induratum. The lesions clinically may be similar. They usually appear at irregular intervals of weeks or months without relation to the season. Their appearance is accompanied by fever and malaise. The lesions are found most commonly on the thighs, though they may occur elsewhere on the extremities or on the trunk.

#### Histology of Erythema Induratum

The histopathologic changes in erythema induratum are intimately associated with blood vessels and are first found and later maximum in the hypoderm. The dermic plane of the skin is only secondarily invaded. The most common finding is a diffuse infiltrate consisting of lymphocytes and plasma cells, at times polymorphonuclear leucocytes, which Michelson has aptly termed fat replacement infiltrate. The arteries and veins are thickened in all coats and endothelial proliferation, even to obliteration, may be present. Elastic and collagenous tissue are destroyed in the infiltrated areas. Yet with the above histologic findings the diagnosis of erythema induratum is not certain, and clinical evidence based on the gross appearance of the involved skin, the course of the eruption, and the presence of tuberculosis elsewhere is needed to establish the diagnosis. In addition to the infiltrate and vessel changes mentioned above, other sections show a foreign body tissue reaction with epithelioid cells and occasional giant cells. Again further evidence

based on clinical findings is necessary for the diagnosis of erythema induratum. Still other sections show typical miliary tubercles. The diagnosis of erythema induratum can then be readily made. Intravascular tubercles involving the endothelium have been reported the earliest site of the tuberculous process in this clinic.

#### Difficulty in establishing the tuberculous origin of erythema induratum by bacteriologic methods

The proof of the tuberculous origin of erythema induratum either by finding tubercle bacilli on stained sections of lesions or by guinea pig inoculations is very difficult. Macleod and Ormsby<sup>11</sup> found tubercle bacilli in only 1 out of 70 sections stained from the lesions of one patient and none in 50 sections stained from the lesions of another. Other attempts to find tubercle bacilli similarly are almost always unsuccessful. Obtaining tubercle bacilli from guinea pigs inoculated with tissue from the lesions is likewise difficult, although it was by this method that Thibierge and Ravaut<sup>9</sup> and later others proved the tuberculous origin of erythema induratum. That the histopathologic changes seen in this condition are the result of an allergic state of the tissue, as recently emphasized by Montgomery,<sup>27</sup> is an acceptable explanation for the failure to find tubercle bacilli in the lesions or to reproduce tuberculosis by animal inoculation.

#### Treatment of erythema induratum

Once the diagnosis of erythema induratum has been made, a careful search for tuberculosis elsewhere should be made. Frequently the presence of other tuberculous lesions has already been recognized and treatment instituted. The prognosis of erythema induratum is good with regard to the general tuberculous infection. However, the lesions are indolent and even with treatment are at times slow to heal. Bed rest with elevation of the legs should be continued until there is no evidence of activity of the infectious process either in the lesions or systemically.

The blood sedimentation rate is a reliable index of activity or quiescence of a tuberculous infection. An elastic cotton bandage should be used as soon as the patient is ambulant. Exposure to cold should be avoided, and precaution to keep the legs warm should be taken. Ample rest and avoidance of fatigue are necessary. Ulcerated lesions should be cleansed and dressed daily. Cod liver oil ointment is an effective topical aid in healing. Ultraviolet light both locally and generally is of some value. Salt free diets, injections of tuberculin, arsphenamine, and gold sodium thiosulphate have been reported helpful. During pregnancy, the woman with erythema induratum often requires special care, and at times prolonged bed rest is necessary. It must be remembered that spontaneous healing of the lesions, though slow, does occur, that the disease is prone to relapses and recurrences.

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IV. GOSSIP

J. D. Textor, Captain, Medical Corps, United States Army, Retired, is now a patient in Ward E-4 Fitzsimons General Hospital, Denver, Colorado. He would be pleased to receive word from his friends....A letter from Pi Thompson who is back from service in the south Pacific states he is temporarily located in Dallas, Texas, headquarters of the 8th service command. He is a major in the medical corps awaiting assignment and wishes to be remembered to everyone...Edward L. Tuohy of the Duluth Clinic, who was a visitor at staff meeting last Friday, writes to say how much he enjoyed his morning on the surgical staff with Dr. Wangenstein, our meeting at noon, and his afternoon with Drs. Peyton and Peterson. He believes all practicing physicians should visit the medical school more often because of the fine uplift it would give them. He wonders if it would not be a nuisance to the staff. This is doubtful as I am sure everyone in our group could profit by the stimulating presence of Ed Tuohy, himself, and in rather liberal doses and at repeated intervals. Few practitioners in Minnesota know as much about us as he does. His splendid summary of the internal medicine situation in this state which was reported in the 25th anniversary issue of Minnesota Medicine illustrates my point....The officers of the component societies of the Minnesota State Medical Association will meet in St. Paul on Saturday, February 27. They will discuss medical affairs as they relate to organized medicine and will hear a lecture by Dr. Haven Emerson in the evening. Dr. Emerson, who is here to help out in the preventive medicine and public health department in the absence of Dr. Gaylord Anderson, has made a splendid contribution to our teaching program. He has truly been a visiting professor. He lives on the campus, drops in on many campus functions, and is always ready and willing to take part in discussions. He has visited rural Minnesota and the outlying centers, and like all public health administrators who have studied the question, he gives credit to the public health nurse as the most important cog in community public health service. Speaking of public health nursing, a group of 54 of them are at the University this week studying the problem of rheumatic fever. Most physicians state we do not have

much rheumatic fever. But mitral stenosis is an indication that some rheumatic infection must be about. The public health nurses are doing a fine job of case finding and follow-up in this disease. There are several representatives from the 6 county plan sponsored by the bureau of crippled children under the direction of Dr. Mally Nydahl. In this limited area a special effort is being made to uncover all rheumatic fever victims, active and inactive, and to bring them adequate medical care....A note from Lieutenant Colonel William S. Middleton, Medical Corps, Chief Medical Consultant, Headquarters, Service of Supply, United States Army, Office of the Chief Surgeon, England, writes "the staff meeting bulletins of the University Hospitals has just arrived. I wish you could see the avidity with which our staff of consultants is pre-empting the numbers for their particular interests. I am indeed thankful for your thoughtfulness. All goes well with me, and I am a much better man for Wisconsin's defeat of Minnesota. Please relay this to Harold S. Diehl, Cecil Watson and others of my friends who might be interested.".... The University of Minnesota General Hospital #26 is in North Africa as letters from various members of the unit indicate. Undoubtedly they are busy now and our thoughts and best wishes are with them.. ..Lieutenant Colonel Edward S. Murphy, Medical Corps, United States Army, writes from Fort McPherson, Georgia to state that the 3,000 bed convalescent hospital which he is organizing is just getting under way....The American College of Surgeons will conduct a special program of war sessions for physicians, surgeons, and hospital representatives at the Lowry Hotel, Monday, March 1, 1943. The program will start at 9:00 and close following an evening program at 8:00. The day will be packed full of interesting discussions for those in military service, those about to go, and those who must remain at home. This is the first of several programs of this type which will be given throughout the country. Subjects in all programs are the same, speakers are different. Captain Waltman Walters, Medical Corps, United States Navy, Executive officer, U. S. Hospital, Corona, Cal., will represent the office of the surgeon general of the U.S. in the St. Paul program.