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Eosinophilic Fasciitis: Clinical Spectrum and Therapeutic Response in 52 Cases

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EOSINOPHILIC FASCIITIS is characterized by scleroderma-like skin changes associated with peripheral eosinophilia, hypergammaglobulinemia, and an elevated ESR. The first published report appeared in 1974.[1] The diagnostic histopathologic findings are thickening and inflammation of the fascia, which in later stages may be sclerosed.[2] The description of the clinicopathologic manifestations of eosinophilic fasciitis has continued to evolve. We reviewed the clinical course of 52 eosinophilic fasciitis patients who have been observed at the Mayo Clinic (Rochester, MN) and performed human leukocyte antigen (HLA) typing in 18 of them. We report the spectrum of their clinical manifestations, associated hematologic/malignant disorders, laboratory findings, tissue histology, HLA status, and response to therapy. The literature is reviewed.

PATIENTS AND METHODS

The records of 52 eosinophilic fasciitis patients seen and observed at the Mayo Clinic were reviewed. Fifteen of these cases have been described in an earlier report.[3] To be included in the review, the patients were required to have a clinical picture with characteristic skin findings and a fascial biopsy with histopathologic findings consistent with the diagnosis of eosinophilic fasciitis. These findings included an inflammatory cell infiltrate and thickening of the deep fascia. All the biopsies were reviewed by at least one of us (W.W.G. or J.A.D.). Patients were followed for 56 ± 13 months (mean ± SD), and a range of 12 to 175 months. Follow-up data and response to therapy were documented by chart review and questionnaires mailed to the patients in September 1985. Of the 52 patients, 42 responded to the questionnaire.

HLA Typing

HLA typing was performed in 18 of the eosinophilic fasciitis patients. HLA-A and -B loci testing was performed by standard microlymphocytotoxicity dye exclusion testing[4] using peripheral blood mononuclear cells from patients and trays of well-categorized sera, most of which had been extensively tested in the Seventh, Eighth, or Ninth International Histocompatibility Workshops. HLA-DR typing was performed on lymphoid cells enriched for B cells by nylon wool separation.[5] The concomitant testing of normal healthy blood donors provided controls.

Statistical Analysis

The proportions of controls with various HLA types were compared with eosinophilic fasciitis patients using Fisher's exact test, and the results are reported as two-tail *P* values.

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RESULTS

Of the 52 eosinophilic fasciitis patients, there were 23 males and 29 females. The ages ranged from 11 years to 72 years, with a mean of 47 ± 18 (SD) years. The duration between onset of initial symptoms and first evaluation at Mayo Clinic was 13 ± 15 months (mean ± SD), and ranged from 1 month to 96 months. Twenty patients were seen within 6 months of their disease onset, 16 patients between 6 and 12 months of disease onset, and 16 patients after 12 months of disease onset. Eosinophilic fasciitis appeared to have been induced by exercise in 24 cases (46%).

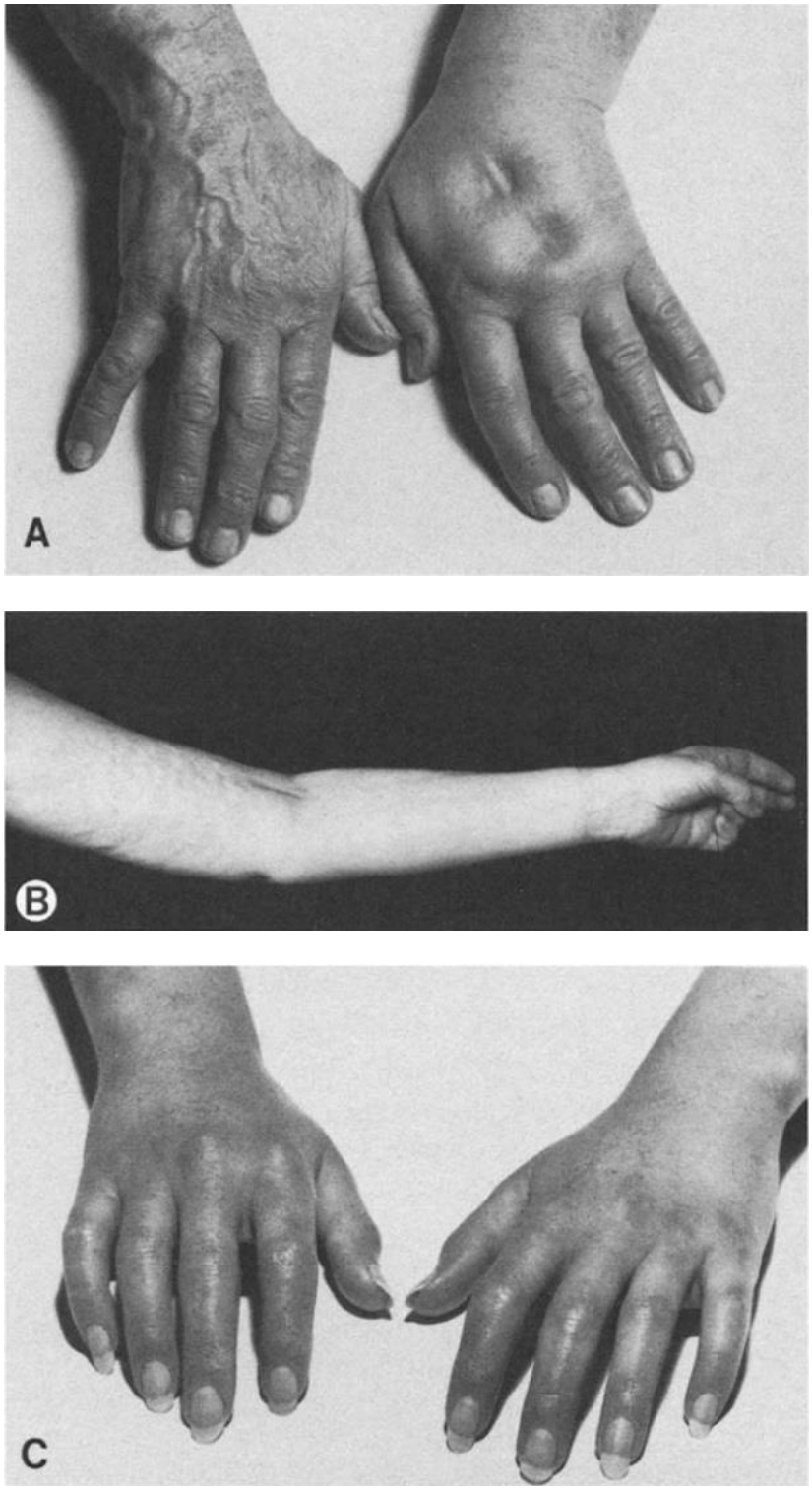

Fig 1. Cutaneous manifestations of eosinophilic fasciitis (A) Pitting edema, (B) peau d'orange, and (C) induration.

Cutaneous Manifestations

The primary presenting symptoms in most cases were cutaneous and included pitting edema, peau d'orange, and induration (Fig 1). The skin changes usually started with swelling and stiffness of the distal parts of the extremities; pitting edema was frequently present at onset. These early changes usually evolved into dimpling or peau d'orange appearance and later into induration. The pattern of cutaneous involvement at the time of first evaluation at Mayo Clinic is shown in Table 1;

Table 1. Patterns of Cutaneous Involvement in Eosinophilic Fasciitis Patients

Skin Changes	No. of Patients (n = 52)
Induration	50
Pedal and lower extremity edema	17
Peau d'orange	11
Hand edema	4
Forearm edema	2

various cutaneous changes may be present in different areas of the body simultaneously. In addition, localized morphea was present in 15 cases (Fig 2). Raynaud phenomenon was present in only one patient.

Arms and legs were involved in 43 patients, with 26 of those having simultaneous hand and/or foot involvement. Virtually any part of the body may be affected (Table 2). Twelve patients had abdominal findings, nine had chest findings, and three each had back, buttocks, and face/neck involvement.

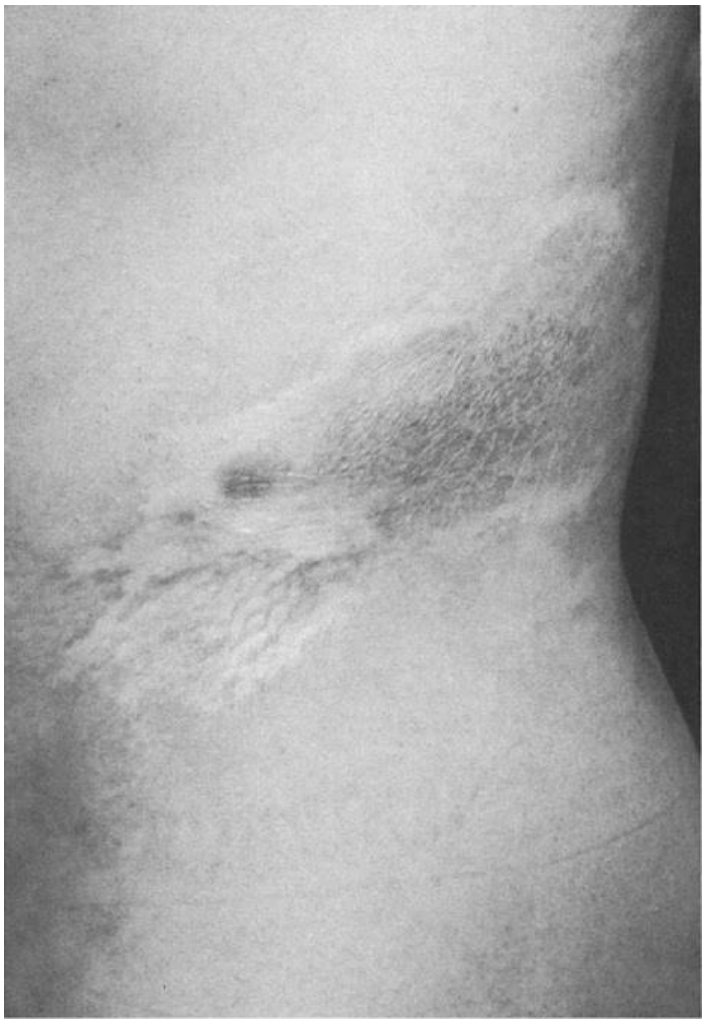

Fig 2. Localized morphea on trunk of a patient with eosinophilic fasciitis.

Extra Cutaneous Manifestations

Joint contractures developed in 29 cases from induration and sclerosis of subcutaneous tissue. The elbows were affected in 15 cases, followed by the wrists in 14, ankles in 14, knees in ten, hands in ten, and shoulders in five. Inflammatory arthritis was present in 21 patients, nine of whom had symmetric polyarthritis and the others had oligo-/monoarthritis. The distribution of arthritis in these patients is shown in Table 3. Of the 14 patients with synovitis of the hands, six had involvement of both metacarpophalangeal joints and proximal interphalangeal joints, five had involvement of metacarpophalangeal joints, and three had involvement of the proximal interphalangeal joints. Two of these cases were initially diagnosed as rheumatoid arthritis (RA); one had erosive changes on roentgenograms and was treated with parenteral gold without benefit.

Table 2. Distribution of Cutaneous Involvement in Eosinophilic Fasciitis Patients

Distribution of Skin Changes	No. of Patients (n = 52)
Extremities	
Arms and legs only	17
Arms and legs with hands/feet	26
Legs only	4
One leg only	1
One leg with foot only	1
Arms and hands only	1
Arms only	1
One arm and hand only	1
Abdomen	12
Chest	9
Back	3
Buttocks	3
Face/neck	3

Table 3. Distribution of Arthritis in Eosinophilic Fasciitis Patients

Joints Affected	No. of Patients (n = 21)
Hands	14
Knees	12
Wrists	8
Elbows	5
Ankles	4
Feet	3
Shoulders	2

Both later developed cutaneous changes and a diagnosis of eosinophilic fasciitis was confirmed by fascial biopsy. Eighteen patients complained of significant morning stiffness lasting up to three hours.

Carpal tunnel syndrome was present in 12 cases. In four patients, this preceded the skin manifestations. None of our patients had clinical involvement of the kidneys, lungs, or heart.

Associated Hematologic Diseases

Associated hematologic diseases were present in five patients; two had thrombocytopenia, and one each had myelomonocytic leukemia, chronic lymphocytic leukemia, and evolving myeloproliferative disorder. One patient had thrombocytopenia 4 years after the onset of fasciitis. Both diseases started within 1 year of each other in the four other patients. The patients with

myelomonocytic leukemia, chronic lymphocytic leukemia, and one patient with thrombocytopenia died of the hematologic disorders.

Laboratory and Other Investigative Tests

Laboratory values are summarized in Table 4. Hemoglobin, leukocyte count, rheumatoid factor, ANA, and creatine kinase were generally normal or negative. Hemoglobin was < 12 g/dL in three (11.6 g/dL, 10.8 g/dL, and 10.8 g/dL). Leukopenia occurred in only one patient (3,400/μL) and one patient had a leukocytosis (14,900/μL).

Table 4. Laboratory Tests in Eosinophilic Fasciitis Patients

Laboratory Test	No. of Patients (n = 52)
Hemoglobin (≤ 12 g/dL	3
Leukocyte count (≤4,100 or ≥ 10,9OO/μL)	2
Rheumatoid factor (positive)	2
ANA (positive)	3
Creatine kinase (elevated)	1/23
ESR (>29 mm/1 h)	15
Hypergammaglobulinemia (> 1.6 g/dL	17/49
Peripheral eosinophilia (>7% or >760/μL)	33/52

Two patients were positive for rheumatoid factor (1:1,280 and 1:640) on a single occasion, but were negative on repeat testing. Neither patient had arthritis. ANA was positive in three patients: 1: 1,280 (speckled pattern), 1:640 (speckled pattern), and 1:256 (homogenous pattern). None of these patients had any other criteria for systemic lupus erythematosus (SLE). Tests for antibodies to extractable nuclear antigens and Scl 70 were not performed. Of the 23 patients tested, creatine kinase was elevated in one patient at 143 U/L (normal range, 15 to 57 U/L). The biopsy showed fasciitis with mild myositis.

Peripheral blood eosinophilia, defined as more than 7% differential count or more than 760/μL absolute count, was present in 33 of the 52 patients (63%). Hypergammaglobulinemia was found in 17 of 49 patients (35%) and an elevated ESR was noted in 15 of 52 (29%). Sixteen of the patients were receiving prednisone 20 mg ± 15 (mean ± SD) daily at the time of their initial visit. Three patients were receiving therapy twice a day, and 13 were receiving a single daily dose.

Pulmonary function tests were performed in 15 patients. One was found to have a mild restrictive defect and another had known chronic obstructive lung disease. Pulmonary function was normal in the rest. Roentgenographic examination of the esophagus (esophogram) was normal in the nine patients examined. Manometric esophageal motility was normal in nine of ten patients tested (one patient had reduction in tone of the lower esophageal sphincter suggestive of scleroderma).

Electromyographic (EMG) examination was performed in 15 patients and was normal in four; 11 patients had nonspecific changes showing motor unit potentials of reduced duration and amplitude. Fibrillation potentials were not seen.

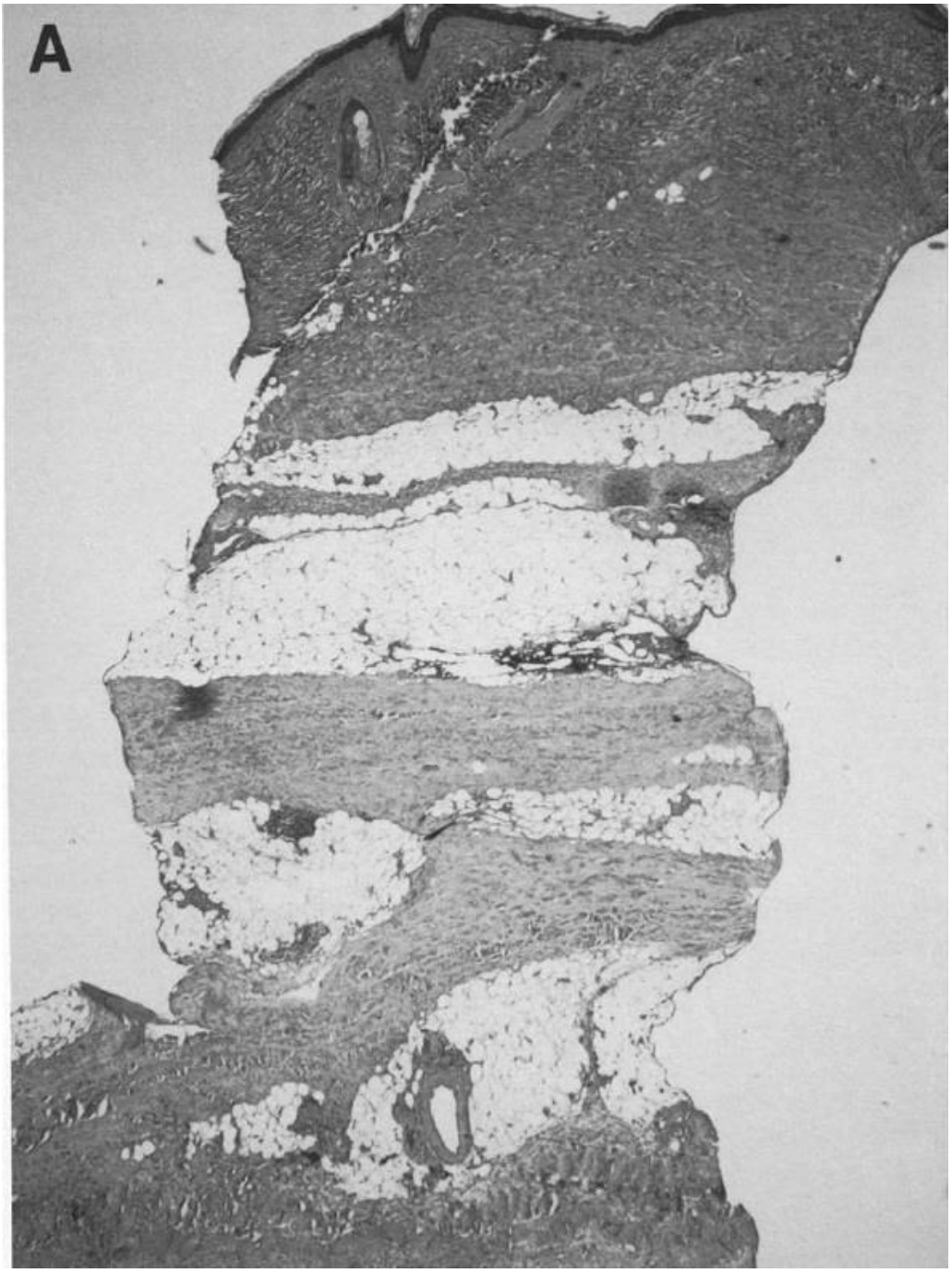

Fig 3. Histopathology of fascia in eosinophilic fasciitis showing (A) thickening of fascia with extension into and replacement of part of the panniculus (hematoxylin-eosin; original magnification x16).

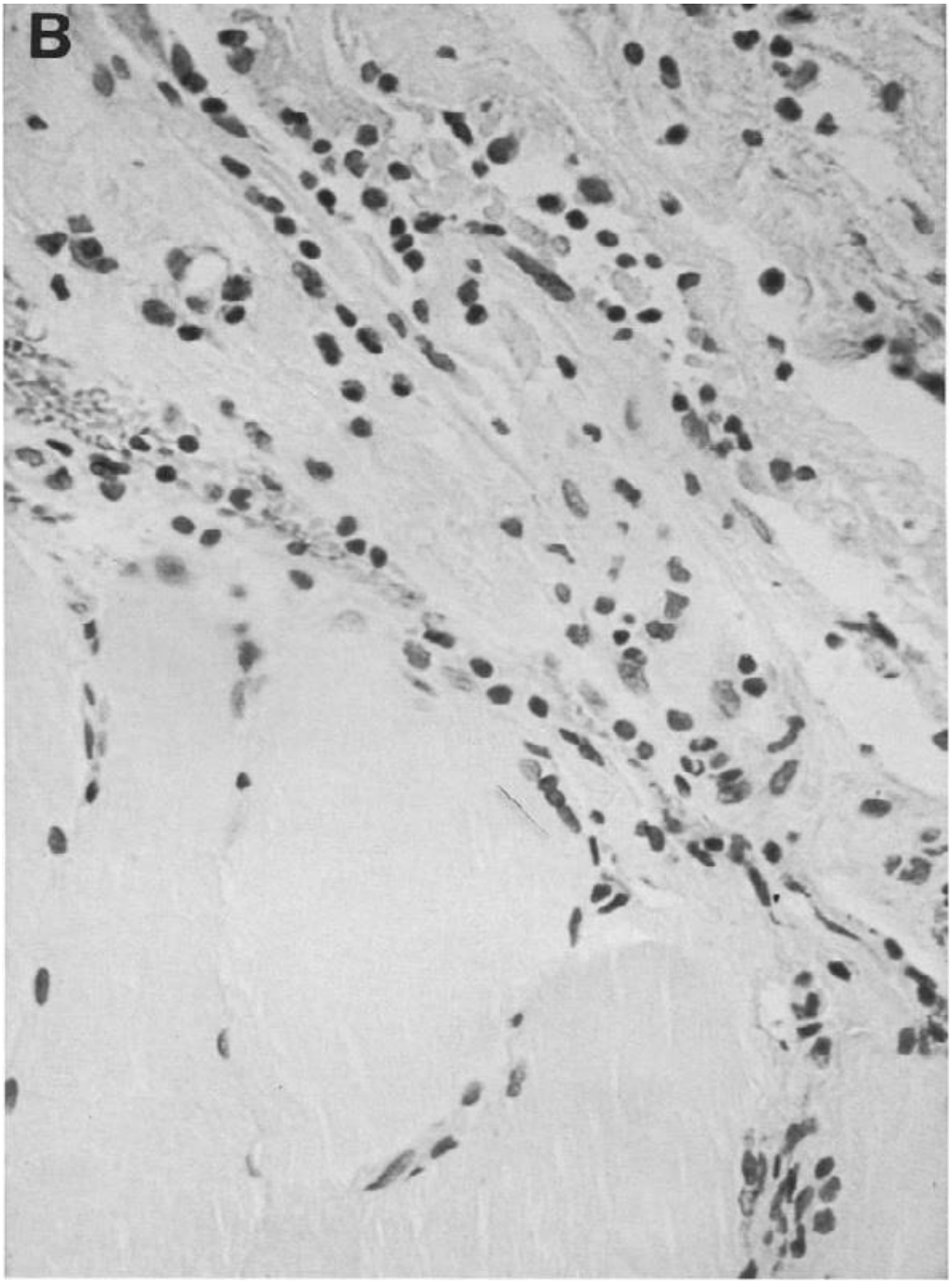

Fig 3. (Cont'd) (B) Cellular accumulation of eosinophils and lymphocytes in the deep fascia with spillover into perimysium (hematoxylin-eosin; original magnification x400).

Histopathology

The epidermis was normal or slightly atrophic and the dermis showed a mild to moderate perivascular accumulation of cells, mainly lymphocytes, although in five patients, eosinophils were prominent. The dermal collagen was normal or mildly sclerotic.

The inflammatory reaction in all biopsy specimens was concentrated in the subcutis (panniculus and deep fascia). The interface between the muscle and fascia was usually well-defined, but the inflammed and sclerotic fascia merged with the thickened interlobular septa of the panniculus. The changes in the fibrous septa of the panniculus became less pronounced as the dermis was approached. The mildest changes detectable consisted of perivascular accumulations of lymphocytes and eosinophils accompanied by swelling, homogenization (of the collagen), and scattered infiltration by eosinophils in the fascia and septa of the panniculus. A perivascular

aggregation of lymphocytes with occasional foamy multinucleated giant cells was seen in the fat lobules (Fig 3).

The most advanced findings showed sclerotic and hyalinized collagen in dense bands running parallel with the surface of the skin. As the dermis was approached, small foci of fat cells were seen wedged between grossly thickened septa. Perivascular infiltrates remained with numerous plasma cells, but eosinophils were hard to find. Deep to the inflamed fascia, degeneration or necrosis of myocytes was rarely noted; many patients demonstrated inflammation in the epimysium similar to but milder than the reaction seen in the fascia and septa of the panniculus. A low-grade myositis along with fasciitis was seen in four cases.

HLA Antigens

HLA-A, -B, and -DR were determined in 18 patients. Results are shown in Table 5. Although HLA AW33, B27, BW42, and DRl appeared to be more common in eosinophilic fasciitis as compared with the controls, no statistical significance was noted after correction for the number of comparisons.

Treatment and Response

Clinical markers of improvement included softening and loosening of the skin and decrease in joint contractures with increased mobility. Overall, the response to treatment was arbitrarily divided into three categories: poor (~25% improvement), partial (>25% improvement but not total resolution), and complete remission.

Thirty-four patients were initially treated with prednisone dosages ranging from 40 mg to 60 mg daily, usually in divided daily dosages. Nine patients had a poor response to prednisone, 20 had a partial response, and five had complete resolution. Eight patients who had a poor response to prednisone were then treated with the addition of hydroxychloroquine, 200 mg to 400 mg daily; two had complete resolution, two had >50% improvement, one had no response, and no follow-up is available on the other three. A response was usually seen after 3 to 6 months.

Table 5. HLA Antigens in Controls and Eosinophilic Fasciitis patients

	Controls		Eosinophilic Fasciitis		
Antigen	No. With	% With	No. With	% With	*P* Value
HLA-A	N = 1161		N = 18		
A1	374	32.2	4	22.2	>.10
A2	574	49.4	13	72.2	.0606*
A3	311	26.8	3	16.7	>.10
A11	157	13.5	4	22.2	>.10
A23	50	4.3	1	5.6	>.10
A24	184	15.8	0	0.0	.0558*
A25	64	5.5	0	0.0	>.10
A26	66	5.7	2	11.1	>.10
A28	107	9.2	1	5.6	>.10
A29	59	5.1	0	0.0	>.10
A30	53	4.6	0	0.0	>.10
A31	49	4.2	1	5.6	>.10
A32	97	8.4	1	5.6	>.10
AW33	17	1.5	2	11.1	.0323*
AW34	1	0.09	0	0.0	>.10
AW68	1	0.09	0	0.0	>.10
Blank	167	14.4	4	22.2	>.10

Table 5. HLA Antigens (Cont'd)

	Controls		Eosinophilic Fasciitis		
Antigen	No. With	% With	No. With	% With	*P* Value
HLA-B					
B5	4	0.3	0	0.0	>.10
B51	95	8.2	4	22.2	.0572*
BW52	16	1.4	0	0.0	>.10
B7	290	25.0	4	22.2	>.10
B8	278	23.9	3	16.7	>.10
B12	2	0.2	0	0.0	>.10
B44	298	25.7	3	16.7	>.10
B45	15	1.3	0	0.0	>.10
B13	41	3.5	1	5.6	>.10
B14	53	4.6	0	0.0	>.10
B15	7	0.6	0	0.0	>.10
BW62	168	14.5	0	0.0	.0939*
BW63	12	1.0	0	0.0	>.10
B16	2	0.2	0	0.0	>.10
BW38	49	4.2	0	0.0	>.10
BW39	28	2.4	1	5.6	>.10
B17	71	6.1	2	11.1	>.10
BW57	27	2.3	0	0.0	>.10
BW58	16	1.4	0	0.0	>.10
B18	113	9.7	0	0.0	>.10
B21	1	0.1	0	0.0	>.10
B49	27	2.3	1	5.6	>.10
BW50	24	2.1	1	5.6	>.10
BW22	5	0.4	0	0.0	>.10
BW54	1	0.1	0	0.0	>.10
BW55	38	3.3	1	5.6	>.10
BW56	18	1.6	0	0.0	>.10
B27	94	8.1	6	33.3	.0026*
B35	158	13.6	4	22.2	>.10
B37	38	3.3	2	11.1	>.10
B40	12	1.0	0	0.0	>.10
BW60	128	11.0	0	0.0	>.10
BW61	38	3.3	1	5.6	>.10
BW42	0	0.0	1	5.6	.0153*
BW59	2	0.2	0	0.0	>.10
Blank	130	11.2	1	5.6	>.10
HLA-DR	N = 479		N = 15		
DR1	86	18.0	6	40.0	.0424*
DR2	132	27.6	6	40.0	>.10
DR3	126	26.3	2	13.3	>.10
DR4	141	29.4	3	20.0	>.10
DR5	80	16.7	0	0.0	.0899*
DRW6	135	28.2	3	20.0	>.10
DR7	104	21.7	3	20.0	>.10
DRW8	35	7.3	2	13.3	>.10
DRW9	11	2.3	2	13.3	.0554*
DRW10	3	0.6	0	0.0	>.10
Blank	105	22.0	3	20.0	>.10

*Not statistically significant when corrected for the number of comparisons.

Eight patients were treated with hydroxychloroquine without prednisone; of these, two had complete resolution, four had partial response, and two were lost to follow-up. Two patients were initially treated with colchicine without any response, but one subsequently had a partial response to prednisone. One patient was treated with D-penicillamine without any response. Five patients did not receive any medication: two had resolution of symptoms, two had >50% improvement, and one had no improvement. No difference was noted in response of patients started on treatment within 6 months of onset of disease, compared with those with longer disease duration. One female with breast carcinoma had almost a complete resolution of eosinophilic fasciitis following mastectomy. We are unaware of other reported cases in whom disease activity responded to removal of a primary tumor.

Laboratory abnormalities, including elevated ESR, peripheral eosinophilia, and hypergammaglobulinemia, reverted to normal with prednisone therapy in almost all patients. However, some patients had progressive skin induration despite normal laboratory studies; therefore, a direct correlation between active clinical disease and abnormal laboratory studies cannot always be made.

Patients seen in the edematous phase had prompt resolution of the edema with prednisone treatment. However, this was not predictive of the response of future skin induration to the same therapy.

Relapses occurred in some patients. A 30-year-old female had a history of six episodes over a 2-year period before evaluation here. Four of the six episodes had spontaneous remission and the other two responded to short, 2-week courses of prednisone. Another patient, a 50-year-old female, had a history of three previous episodes. Each episode started in the spring, with increasing work on the farm, and spontaneously resolved in the fall/winter when farm work decreased.

DISCUSSION

Eosinophilic fasciitis was first reported in 1974[1]; with inclusion of our cases, over 200 eosinophilic fasciitis patients have been reported.[6] With the increasing number of cases recognized, the clinical spectrum of eosinophilic fasciitis has grown since its initial description.[1] The skin changes appear to evolve through three stages. The majority of patients start with an edematous phase that may include pitting edema of the extremities. This changes to a peau d'orange appearance of the skin. The last stage is that of induration with tight skin. Various stages of cutaneous involvement may be present simultaneously in different areas of the body. The arms and legs are the most common sites of involvement, with many patients having simultaneous hand and foot involvement. Localized morphea was also present in a significant proportion (29%) of our cases. It has been suggested that the cutaneous clinical findings depend on the level of cutaneous inflammation and sclerosis.[7] In localized morphea, the inflammatory process is most intense in the reticular dermis and superficial panniculus. In eosinophilic fasciitis, it is most localized in the fascia spreading to the panniculus. It is possible that there may be sufficient overlap to make distinction purely on the basis of clinical inspection impossible, and these diseases represent a spectrum of scleroderma-like diseases. We are unaware of the coexistence of these diseases in other reported cases. Peripheral eosinophilia can be transient even in the absence of specific treatment, so one cannot dismiss the diagnosis because of normal laboratory findings. Eosinophilia may be seen on histologic examination of the fascia, but is not required for the diagnosis. Its presence in the fascia seems to correlate with the presence or absence of peripheral eosinophilia.[2]

Arthritis with eosinophilic fasciitis has been reported,[8-12] including erosive arthritis.[9,10] Arthritis was present in 44% of our cases. Two of the cases were initially thought to have RA and treated as such, until the characteristic cutaneous changes of eosinophilic fasciitis later developed. Our experience suggests that arthritis is a frequent manifestation of eosinophilic fasciitis, and may be the presenting symptom in some patients.

EMGs were abnormal in 11 of 15 patients tested (73%), only one of whom had a minimally elevated creatine kinase. Four of these patients had a low-grade myositis on biopsy. The presence of a low-grade myositis in eosinophilic fasciitis has been reported by others.[2,13-16] This may be more common than generally appreciated, despite normal creatine kinase levels. EMG appears to be the most sensitive test for low-grade myositis in eosinophilic fasciitis. Thus, the anatomic structures involved in eosinophilic fasciitis may be more extensive than usually realized.

Carpal tunnel syndrome was present in 12 patients (23%) and has been previously described in eosinophilic fasciitis patients.[2,3,12,14,17] Visceral involvement in eosinophilic fasciitis has been infrequently reported with isolated cases of esophageal,[18,19] pulmonary,[6,10,11,20-23] and cardiac[24] involvement. Of our ten patients studied for esophageal motility, only one was found to have reduced tone of the lower esophageal sphincter. Likewise, of the 15 patients who had pulmonary function tests, only one was found to have a mild restrictive defect. None of the patients had cardiac or renal involvement attributable to eosinophilic fasciitis. These data suggest that visceral involvement in eosinophilic fasciitis is uncommon.

An association between eosinophilic fasciitis and hematologic disorders has been suggested. Aplastic anemia has been reported in ten cases,[25-29] thrombocytopenic purpura in three cases,[29,30] and one case each with myeloid leukemia,[3] myeloproliferative disorder,[3] Hodgkin disease,[31] pancytopenia,[32] and preleukemia.[11] Five of our patients had associated hematologic disorders, although none had aplastic anemia. Eosinophilic fasciitis, when associated with hematologic disorders, appears to carry a poor prognosis. It has been shown that the coexistent thrombocytopenia and aplastic anemia are due to antiplatelet antibodies and a circulating inhibitor of erythroid stem cells, respectively.[30] Inhibition of the growth of committed erythroid and granulocytic progenitor cells by the IgG serum fraction of an eosinophilic fasciitis patient with aplastic anemia has been reported.[26] Abnormal bone marrow microenvironment has also been implicated as a possible pathogenic mechanism underlying eosinophilic fasciitis and aplastic anemia.[27] However, hypotheses of suppression of normal hematopoiesis by immunologic or other means do not explain malignant transformation of hematopoietic cells, as observed in three of our cases and also reported by others.[11,31]

We did not find any significant association between HLA and eosinophilic fasciitis. Lynch et al[33] also reported no association of HLA-A or -B and eosinophilic fasciitis.

Initial reports suggested that eosinophilic fasciitis is a cortisone-responsive condition with a benign course.[34] However, this has not borne out in all cases. Several other pharmacologic agents have been used, including D-penicillamine,[35] chloroquine,[3,35] azathioprine,[35] and cimetidine.[36] In addition, two of our patients were treated with colchicine without any benefit. Only 59% of our cases had a satisfactory response to prednisone alone. Polypharmacy using prednisolone and azathioprine with either hydroxychloroquine or D-penicillamine has been reported to be effective in patients with eosinophilic fasciitis.[35] Interestingly, hydroxychloroquine alone showed satisfactory improvement in 62.5% of the cases treated and thus, is comparable with the response seen with prednisone alone. The value of cimetidine, D-penicillamine, and colchicine in treatment of eosinophilic fasciitis is unknown because of the small number of patients treated. The fact that four of the five untreated patients had spontaneous improvement of their disease, with resolution in two, questions the validity of the use and efficacy of any mode of treatment for eosinophilic fasciitis. Prospective, double-blind, placebo-controlled studies are required to definitively answer this question.

It has been suggested that eosinophilic fasciitis may be a variant of scleroderma,[22,37-40] while others maintain that it is a distinct syndrome.[34,41] There are several distinguishing features between eosinophilic fasciitis and scleroderma (Table 6).

Table 6. Distinguishing Features of Eosinophilic Fasciitis and Scleroderma

Features	Eosinophilic Facsciitis	Scleroderma
Sex	Equal or more common in males	More common in females
Onset with physical exertion	May be present	No known relationship
Involvement of hand	Less common	Usual (almost 100%)
Raynaud phenomenon	Uncommon	Present
Telangiectases	Uncommon	Common
Digital ulcers	Absent	May be present
Visceral involvement	Uncommon	Common
Hypereosinophilia in blood	Common	Uncommon
Hypergammaglobulinemia	Usual	Unusual
Elevated ESR	Usual	Less common
ANA	Uncommon	Usual
Associated hematologic disorders	May be present	No known relationship
Course	Usually benign	Decreased life expectancy
Nail-fold capillary microscopy	Normal	Abnormal
Skin histology	Epidermis and dermis usually spared	Epidermal atrophy with dermal thickening and fibrosis
Fascial histology	Inflammation	Normal

Scleroderma is more common in females and eosinophilic fasciitis has been reported to be more common in males,[34,36] or equal in both sexes.[41] There have been reports of Raynaud phenomenon in only isolated cases of eosinophilic fasciitis,[19,21] while it is a common finding in scleroderma. Other common findings in eosinophilic fasciitis not frequently found in scleroderma include a peripheral eosinophilia, hypergammaglobulinemia, elevated sedimentation rate, normal nail-fold microscopy, sparing of the epidermis and dermis on skin biopsy, and relation to exercise as the initiating event in many patients. Also, there are only isolated case reports of visceral involvement in eosinophilic fasciitis, with no reported cases of renal disease or accelerated hypertension. Based on the differentiating features, we feel there is adequate evidence to identify eosinophilic fasciitis as a disease entity distinct from scleroderma.

Despite the accumulation of knowledge regarding the clinical aspects of eosinophilic fasciitis, its etiology remains unknown. The hypergammaglobulinemia, deposition of IgG and complement in the fascia of some patients, and the presence of inflammatory cell infiltrates in eosinophilic fasciitis suggest an aberrant immune response. Persistent elevations of serum immune complex levels in eosinophilic fasciitis has been reported,[42] while others have found the tests for circulating immune complexes to be negative.[24] The role of eosinophils may be a hypersensitivity reaction to an unidentified toxin[43] or a reaction pattern of chronic inflammation.[44] Increased serum eosinophilotactic activity due to an eosinophilotactic serum factor in patients with eosinophilic fasciitis has been reported.[45] Another interesting factor is the precipitation of eosinophilic fasciitis by physical exertion in many patients. Whether this triggers an antigenic alteration[44,45] or aggravates an underlying subclinical disease[42] is not known. Despite various hypotheses, the etiology of this intriguing syndrome remains speculative.

SUMMARY

The clinical course of 52 cases with eosinophilic fasciitis observed at the Mayo Clinic has been described. Cutaneous changes included pitting edema, peau d'orange, and induration, and may affect virtually any body surface area. In addition, localized morphea was present in 15 cases. Arthritis was observed in 21 patients; 29 patients had flexion contractures and 12 had carpal tunnel syndrome. Associated hematologic diseases were found in five patients; thrombocytopenia in two, myeloproliferative disorder in one, myelomonocytic leukemia in one, and chronic lymphocytic leukemia in one. Peripheral blood eosinophilia was noted in 33 of 52 patients, hypergammaglobulinemia was noted in 17 of 49, and elevated sedimentation rate was noted in 15 of 52. Nonspecific EMG changes were seen in 11 of 15 patients. None had clinical involvement of

the kidneys, lungs, or heart. No significant association between any HLA-A, -B, or -DR and eosinophilic fasciitis was seen. Prednisone and hydroxychloroquine seemed equally beneficial in treatment; however, some cases showed spontaneous recovery, making evaluation of therapeutic efficacy difficult. Relapses occurred in some cases.

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