Localized Polyarteritis Nodosa in the Forearm and Epididymis

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We report localized polyarteritis nodosa in a 31-year-old man who had painful nodules in the left forearm and scrotum. Histopathological findings of both tissues revealed distinct arteritis. However, he had no clinical evidence of any systemic disease. We finally diagnosed this case as a localized polyarteritis nodosa occurring in both the left forearm and epididymis. This form of polyarteritis nodosa has not been reported in the literature.
(Internal Medicine 33: 48–52, 1994)

Key words: arteritis, forearm, brachioradialis muscle, epididymis

Introduction

The term polyarteritis describes the classic syndrome of polyarteritis nodosa described by Kussmaul and Maier in 1866 (1). Most polyarteritis nodosa presents as generalized necrotizing arteritis. However, variants of polyarteritis nodosa have been reported as polyarteritis nodosa localized to some organs and are known to run a mild course. The type of polyarteritis nodosa which affects primarily the skin is called cutaneous polyarteritis nodosa; if less commonly affects the epididymis or muscles. Since the first comprehensive review of localized arteritis by Plaut in 1951 (2), there have been several reports of benign self-limited necrotizing arteritis confined within a single organ – the epididymis, skeletal muscle, gallbladder, uterus, breast, testis, kidney and central nervous system. It has been known that necrotizing arteritis isolated to a particular tissue without any systemic manifestation is rare (2–6). In 1977, Roy and associates reported the first case of polyarteritis nodosa localized to the epididymis (7). After that, fewer than ten cases of localized polyarteritis nodosa of the testis or epididymis with testicular signs and symptoms have been reported (8–13). In 1970, Golding and associates described polyarteritis nodosa manifested as calf myositis (14). In 1992, Garcia et al reviewed only five cases of localized polyarteritis nodosa confined to the calf muscle (15). Here we report a case of localized polyarteritis nodosa occurring in both the left forearm and epididymis without any systemic manifestation.

Case Report

A 31-year-old farmer noticed painful swelling of the left lateral forearm in May 1990. He visited a physician and was followed without medication. The forearm pain was reduced spontaneously, however the swelling remained. In April 1991, he suffered from swelling and pain in the left scrotum and was treated with antibiotics for epididymitis by another physician. However, the scrotal swelling was not relieved as well as the forearm swelling. In July 1991, he consulted the Department of Orthopedics in our hospital for the swelling of the left forearm. On physical examination, the skin was normal. There was no evidence of generalized adenopathy. There was no sign or symptom of polyarthritis nor was there any abnormal neurological finding. Due to the stiffness of his forearm, extension was slightly disturbed. An ill-defined firm elastic mass, measuring 5×7 cm, was palpated beneath the skin of the upper radial side of the left forearm. On magnetic resonance imaging, high signal intensity was evident at the area coinciding with the mass. A soft tumor was suspected and a biopsy was performed. The specimen obtained consisted of white to light-yellow thick fibrous tissue adherent to the fascia of the brachioradialis muscle. Histopathological study of the resected tissue, including the fascia and striated muscle, demonstrated arteritis distinctly involving some of the medium-sized muscular type arteries (Fig. 1a, b), and associated with diffuse fibrosis and infiltrations by eosinophils, lymphocytes and plasma cells. Occasional foci of lymphoid cell aggregation were evident even in the inter-muscular spaces. There was also intense perivascular infiltration by lymphocytes and plasma cells throughout the tissues examined. As the histopathological findings definitively disclosed arteritis, he was referred to our department on September 2, 1991 for further examination.

Physical examination revealed a well-developed man with a

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Received for publication November 9, 1993; Accepted for publication November 30, 1993

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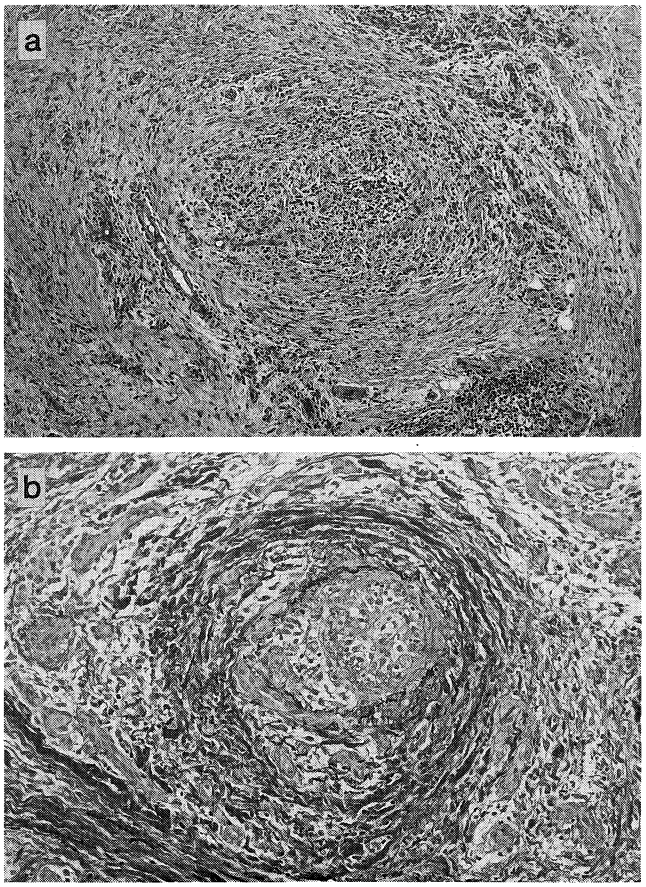

Fig. 1. Arteritis obliterans, associated with perivascular fibrosis and lymphocyte infiltration (a), and irregularity of surrounding elastic fibers (b) seen in a muscular type artery of the forearm. Internal elastic laminae were destroyed (a: HE stain, ×90, b: Elastica-van Gieson stain, ×180).

height of 168 cm, weight of 56 kg and blood pressure of 108/66 mmHg. There was no abnormality of his chest or abdomen. A diffuse elastic mass of the left epididymis and testis was palpable with dull pain. The patient did not have any history of urogenital diseases or scrotal trauma. Nor was there any generalized adenopathy, sign or symptom of polyarthritis or any abnormal neurological finding.

Laboratory findings on admission (Table 1) included a normal urinalysis and erythrocyte sedimentation rate of 12 mm/hr. Complete blood counts were normal with a leukocyte count of 5,100/μl and a normal differential cell count. Blood chemistry analyses revealed no abnormality and the serum electrophoresis showed a normal gammaglobulin fraction of 20.6%. Renal function was normal according to the creatinine clearance and phenolsulfophthalein test. On serological examination, only the C-reactive protein was slightly high at 1.2 mg/dl. Serological tests for syphilis, circulating hepatitis B antigen and autoantibodies were negative. Complement levels were also within normal limits. The skin test for PPD was positive. A chest plain roentgenography film was normal and abdominal computed tomography revealed no abnormality in the liver, spleen, kidneys or pancreas. An ultrasonogram revealed a hyper-echoic mass in the area of the left epididymis and testis with no sign of hydrocele. We suspected the presence of arteritis in the testis and epididymis as well as the left forearm, however, the possibility of neoplasm could not be ruled out. Therefore, left orchiectomy was performed in the Department of Urology of our hospital. Extirpated specimens of the left epididymis contained a white-yellow hard mass. The spermatic cord was also enlarged. The findings in the epididymis and surrounding parts were essentially the same as those observed in the left forearm lesion. Diffuse loose or dense fibrosis was noticeable.

Table 1. Laboratory Data on Admission

Urinalysis		TP (g/dl)	7.4	HBs-Ag	(–)
Protein (mg/dl)	10	Alb (%)	60.1	Wa-R	(–)
Occult blood	(–)	α1-gl (%)	2.3	CH50 (U/ml)	40.9
Cast	(–)	α2-gl (%)	7.7	C3 (mg/dl)	81.4
ESR (mm)	12	ß-gl (%)	9.3	C4 (mg/dl)	33.0
Peripheral blood		γ-gl (%)	20.6	IC (μg/ml)	<1.5
Hb (g/dl)	16.4	IgG (mg/dl)	1,710	ASK	640
RBC (×104/μl)	20.5	IgA (mg/dl)	449	8 Fact.ass.Ag(%)	156
Plt (×104/μl)	512	IgM (mg/dl)	186	Cryoglobin	(–)
WBC (/μl)	5,100	IgE (IU/l)	936.9	CD3 (%)	78.0
(st6, seg50, eo4,		Na (mEq/l)	138	CD4 (%)	50.0
mo6, ba2, ly32%)		K (mEq/l)	4.3	CD8 (%)	29.9
Blood chemistry		Cl (mEq/l)	103	CD4/CD8 ratio	1.7
GOT (IU/l)	44	Fe (μg/dl)	49	PPD (mm)	15×20/45×28
GPT (IU/l)	12	UIBC (μg/dl)	248	Thyroid function	
LDH (IU/l)	328	AFP (ng/ml)	3.59	T3 (ng/dl)	116
CPK (IU/l)	906	Serological exam		F-T4 (ng/dl)	1.2
T-Bil (mg/dl)	0.7	CRP (mg/dl)	1.2	TSH (μg/ml)	2.9
γ-GTP (IU/l)	93	RA test	(–)	EKG	W.N.L.
T-CHO (mg/dl)	153	ANF	(–)	Chest plain radiograph	
BUN (mg/dl)	7	Anti-DNA Ab	<80		W.N.L.
Crn (mg/dl)	0.9	TGHA	<100		
UA (mg/dl)	7.3	MCFA	<100		

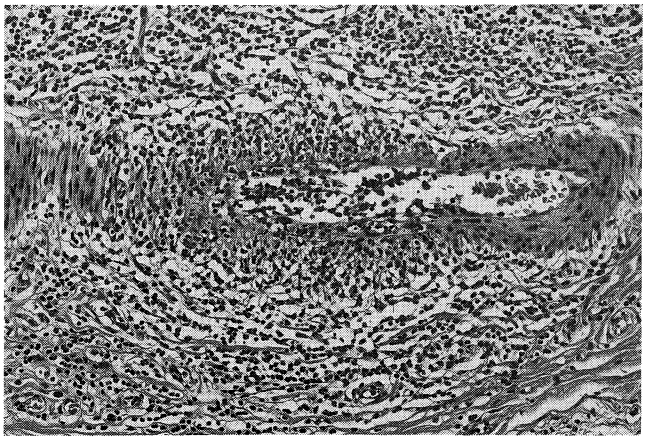

Fig. 2. Marked perivascular lymphocyte infiltration seen in the arterial wall of the resected epididymis. Numerous lymphocytes and plasma cells infiltrate the small arteries of the epididymis which was consequently destroyed (HE stain, ×180).

Small muscular type arteries were characterized by moderate infiltrations of lymphocytes, plasma cells, and often, aggregated lymphocytes (Fig. 2). Some arteries had disrupted walls or obliterated lumina. Immunohistochemical studies of both the left forearm and epididymis revealed that among the infiltrated lymphocytes, cell aggregates consisted mainly of B cells, reactive with L26 antibody (DAKO PATTS). However, T cells reactive with UCHL-1 antibody (DAKO PATTS) were predominant in the perivascular areas. Ultimately, we diagnosed this case as a polyarteritis nodosa localized to both the left forearm and epididymis without any clinical systemic symptom.

The patient was given 40 mg prednisolone daily for the left forearm swelling and mild pain. Within 2 weeks, the swelling disappeared completely and the CRP normalized. He was discharged on October 23, 1991, under instructions to taper his prednisolone. Thereafter, he was medicated with 10 mg prednisolone on alternate days and has had no sign of recurrence for two years after the onset.

Discussion

Systemic polyarteritis nodosa is defined as a necrotizing inflammatory process involving medium-sized arteries. Testicular and epididymal involvement in this disorder are common with the reported incidence ranging from 60 to 80% at autopsy (16, 17). Therefore, testicular biopsy may be one of the important diagnostic procedures for this disease (18, 19), even though only 2 to 18% of the patients have a symptomatic testicular and/or epididymal manifestation, namely, a nodule, swelling or pain (17, 20). On the other hand, localized polyarteritis nodosa has been reported to occur in a number of organs, including the gallbladder, appendix, testis, epididymis, breast, uterus and skin (2–6). In these cases, skin lesions were occasionally recognized (21), and it has been argued whether localized polyarteritis nodosa of the skin is a clinical entity distinct from the systemic type. Although this patient had two isolated lesions in both the left forearm and the epididymis, we diagnosed this case as a localized type of polyarteritis nodosa which was found in two locations, because there was no clinical evidence of a systemic disease and the subcutaneous lesion was located in a small area beneath the skin of the left forearm.

Localized polyarteritis nodosa differs from generalized polyarteritis nodosa in some of its characteristics; 1) clinically there is no associated fever or multiple organ involvement, 2) there exists no serological abnormality on laboratory examinations, 3) there exists no histopathological evidence for arteritis to be localized to small arteries and medium-sized muscular arteries of some organs, 4) after resection of the lesions, focal and general symptoms disappear, therefore subjective complaints and objective symptoms are not exercerbated, and 5) maintenance therapy with a low dose of prednisolone is effective and the prognosis is fair (22, 23).

In the present case, arteriography of the abdominal aorta, urinalyses and renal studies revealed no abnormality. While on maintenance therapy with prednisolone 5 mg/day, the clinical course was uneventful and the symptoms subsided. Thus, this case is thought to be compatible with localized polyarteritis nodosa, even though a localized lesion was confirmed at two different sites–the left brachioradialis muscle and the left epididymis. Histopathological studies confirmed the diagnosis of arteritis. No other site, including the kidney, was biopsied. The possibility still exists that there may have been arteritis of other organs. Our observations, however, led us to conclude that localized polyarteritis nodosa is distinct from early stage or mild systemic polyarteritis nodosa.

To our knowledge, only eight cases of localized polyarteritis nodosa of the epididymis with testicular or epididymal symptoms have been reported (Table 2). In every case, the patient had a scrotal mass with or without pain and that was diagnosed after biopsy or surgery. No one had any systemic symptom, although one patient had combined Whipple's disease and euthyroid Graves' disease (13). Accordingly, it has been speculated that Whipple's disease may be related to isolated arteritis through the circulating immune complexes. The present case is thought to be typical, except that the present case is the first report of a case in whom isolated arteritis is manifested at two different sites. Because isolated arteritis may exist simultaneously at different sites, the cause of isolated arteritis may be related not only to a local factor, but also to some systemic factor. It is difficult to diagnose systemic polyarteritis nodosa, and the localized type is even more difficult to diagnose because in some cases there is only histopathological evidence of arteritis compatible with localized polyarteritis nodosa. Furthermore, localized polyarteritis nodosa may be the first manifestation of systemic polyarteritis nodosa and multiple organ involvement. Shurbaji and Epstein identified only three cases of isolated asymptomatic necrotizing arteritis of the testis in their huge surgical pathology and autopsy files (24). Among these, two cases were found by chance at autopsy and one was found at orchiectomy for metastatic prostate carcinoma.

Table 2. Reported Cases of Symptomatic Localized Polyarteritis Nodosa of the Epididymis

Case	Author	A.D.	State	Age	Side	Sign or symptom	Period*	Diagnostic procedure	Pathologic Finding	Final diagnosis
1	Roy et al	1977	USA	44	Rt	Scrotal swelling	8 M	Epididymectomy	Granulomatous lesion, periarteritis nodosa	Periarteritis nodosa of epididymis
2	Fujimori et al	1983	Japan	56	Rt	Scrotal pain	16 Y	Orchiectomy	Necrotizing arteritis, arteritis of epididymis	Localized necrotizing
3	McLean & Burnett	1983	Scot-land	25	Lt	Scrotal swelling	5 W	Biopsy	Granulomatous, necrotizing vasculitis	Polyarteritis nodosa of epididymis
4	Sawada et al	1985	Japan	31	Lt	Scrotal swelling	3 M	Epididymectomy	Periarteritis nodosa	Periarteritis nodosa of epididymis
5	Womack & Ansell	1985	UK	37	Lt	Tender mass	3 W	Nodule	Necrotizing arteritis	Isolated arteritis of epididymis
6	Womack & Ansell	1985	UK	17	Rt	Maldescent testis	**	Orchiectomy	Necrotizing arteritis	Isolated arteritis of epididymis
7	Takai et al	1986	Japan	23	Lt	Scrotal swelling	1 M	Orchiectomy	Periarteritis nodosa, fatty degeneration	Local periarteritis nodosa-like lesion
8	Middle-kauff et al	1987	USA	55	Lt	Mass in testis Whipple's disease	2 W	Orchiectomy	Necrotizing vasculitis	Polyarteritis nodosa of epididymis
9	Present case	1991	Japan	31	Lt	Scrotal swelling & swelling of forearm	1.5 Y	Orchiectomy & biopsy	Necrotizing arteritis	Localized polyarteritis nodosa o epididymis & forearm

*period before visit, **not described.

Our literature review revealed five cases of isolated lower extremity myositis. To the best of our knowledge, however, involvement of brachioradialis muscle has not been described. Golding and associates (14) described three patients who had polyarteritis with leg pain. However, only one patient had the disease truly confined to the muscle. The present patient represents to the best of our knowledge, the 7th case to be reported of isolated muscular polyarteritis nodosa without laboratory or clinical evidence of systemic involvement (15).

Localized polyarteritis nodosa is usually associated with a good prognosis and medication with corticosteroids or immunosuppressive agents may not be needed as in systemic polyarteritis nodosa. For the pain and swelling in the left forearm in the present case, prednisolone was administered and thereafter, the symptoms disappeared completely. The subject has had no recurrence for two years after onset. However, it remains possible that localized arteritis is an initial manifestation of systemic arteritis (21). The good response to corticosteroids alone, may be similar to that in systemic polyarteritis nodosa since such localized forms may represent. In fact, cases of systemic polyarteritis nodosa in which early diagnosis and adequate treatment prevent progression to the more generalized form. However, this seems unlikely in view of the chronicity of symptoms seen before diagnosis in some reported cases. Therefore, close follow-up of the patient is necessary to exclude any systemic disorder.

In summary, we have described a male patient, who presented with a left scrotal mass and left forearm pain who was found to have polyarteritis nodosa of the brachioradialis muscle and epididymis. The patient had a benign course with resolution of symptoms after resection of both lesions and prednisolone therapy. We suggest, after a review of the literature, that this localized form of polyarteritis nodosa localized to the muscle and epididymis has a good prognosis and responds readily to corticosteroids.

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