Table 1 Density of different types of inflammatory cells present in control fascia tissue and Dupuytren's contracture nodules

	Cells in 10 high power fields		
Group	**CD45 positive**	**S100 positive**	**Foci of lymphocytic infiltration**
Control	0.41 (0.69)	0.16 (0.37)	Absent in all specimens
Dupuytren	*4.91 (3.28)	1.24 (1.26)	Present in 13/20 specimens

Results are shown as mean (SD).
*$p<0.01$ for the comparison *v* control.

nerve fibres in Dupuytren's contracture add a new fibrogenic inflammatory component to the already described inflammatory infiltration. Mast cells outnumber the CD45 positive inflammatory cells and S100 positive Langerhans' cells within the fibrotic tissue.

Both mast cells and nociceptive nerve fibres can contribute to the proliferation of fibroblasts on their own and in a coordinated fashion. Mast cells are known to be a source of several fibrogenic mediators such as platelet derived growth factor, transforming growth factor β, and basic fibroblast growth factor that can be released upon stimulation of mast cells.[7] Mast cell degranulation can be elicited by SP released from nociceptive nerve fibres.[8] Additionally, SP stimulates the proliferation of fibroblasts and the production of transforming growth factor β by fibroblasts.[9]

A strikingly similar inflammatory condition, termed interstitial cystitis, can take place in the urinary bladder of middle aged white women.[10] It is characterised by fibrosis of the bladder wall, a mast cell rich inflammation, and sprouting of SP positive nerve fibres.[10] We propose that Dupuytren's contracture is an inflammatory disease dominated by mast cells, bearing similarities to interstitial cystitis.

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REFERENCES

1 **Saar JD**, Grothaus PC. Dupuytren's disease: an overview. *Plast Reconstr Surg* 2000;**106**:125–34.
2 **Baird KS**, Alwan WH, Crossan JF, Wojciak B. T-cell-mediated response in Dupuytren's disease. *Lancet* 1993;**341**:1622–3.
3 **Qureshi FI**, Hornigold R, Spencer JD, Hall SM. Langerhans cells in Dupuytren's contracture. *J Hand Surg [Br]* 2001;**26**:362–7.
4 **Meek RM**, McLellan S, Crossan JF. Dupuytren's disease. A model for the mechanism of fibrosis and its modulation by steroids. *J Bone Joint Surg Br* 1999;**81**:732–8.
5 **Miller LE**, Justen HP, Scholmerich J, Straub RH. The loss of sympathetic nerve fibers in the synovial tissue of patients with rheumatoid arthritis is accompanied by increased norepinephrine release from synovial macrophages. *FASEB J* 2000;**14**:2097–107.
6 **Baird KS**, Crossan JF, Ralston SH. Abnormal growth factor and cytokine expression in Dupuytren's contracture. *J Clin Pathol* 1993;**46**:425–8.
7 **Beer TW**, Baldwin H, West L, Gallagher PJ, Wright DH. Mast cells in pathological and surgical scars. *Br J Ophthalmol* 1998;**82**:691–4.
8 **Mori N**, Suzuki R, Furuno T, McKay DM, Wada M, Teshima R, *et al*. Nerve-mast cell (RBL) interaction: RBL membrane ruffling occurs at the contact site with an activated neurite. *Am J Physiol Cell Physiol* 2002;**283**:C1738–44.
9 **Lai XN**, Wang ZG, Zhu JM, Wang LL. Effect of substance P on gene expression of transforming growth factor beta-1 and its receptors in rat's fibroblasts. *Chin J Traumatol* 2003;**6**:350–4.
10 **Selo-Ojeme DO**, Onwude JL. Interstitial cystitis. *J Obstet Gynaecol* 2004;**24**:216–25.

Arterial stiffness in Behçet's disease: increased regional pulse wave velocity values

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Diverse vascular lesions occur in about one third of patients with Behçet's disease (BD). Endothelial dysfunction is known to have an important role in the development of these lesions.[1] Acute systemic inflammation and chronic systemic vasculitis are associated with endothelial dysfunction.[2 3] Moreover, inflammation is an important risk factor for future cardiovascular events.[4] These findings have led to the hypothesis that acute and chronic inflammatory processes associated with BD may cause endothelial dysfunction, which can then lead to a subsequent increase of arterial stiffness and vascular damage that are closely related to the clinical course of BD. Arterial stiffness is a reliable predictor of subsequent cardiovascular mortality and vascular damage. Pulse wave velocity (PWV) is an ideal indicator of arterial stiffness.[5 6] Most investigators have studied PWV only in the aorta, although PWV should be measured along the entire arterial tree.[6] Therefore we investigated PWV of different regions in patients with BD.

This study included 53 patients with BD who fulfilled the International Study Group criteria[7] and 65 controls. Subjects with hypertension, diabetes mellitus, or a previous history of coronary artery disease or myocardial infarction were

Table 1 Clinical characteristics and cardiovascular variables of the study group

Variables	Behçet's group (n = 53)	Controls (n = 65)	p Value
Age (years)	38.1 (8.1)	38.2 (8.0)	NS
Men, No (%)	27 (51)	32 (49)	NS
Height (cm)	164.7 (8.5)	163.8 (8.2)	NS
Body mass index	22.1 (2.9)	22.7 (2.7)	NS
Systolic blood pressure (mm Hg)	119.2 (11.1)	117.2 (9.6)	NS
Diastolic blood pressure (mm Hg)	73.8 (8.3)	72.5 (7.9)	NS
Mean blood pressure (mm Hg)	90.9 (9.0)	88.4 (8.1)	NS
Pulse pressure (mm Hg)	45.4 (8.0)	46.3 (6.1)	NS
Heart rate (bpm)	65.2 (7.8)	65.5 (9.9)	NS
Smokers, No (%)	8 (15)	9 (14)	NS
Serum glucose (mmol/l)	4.7 (0.5)	4.8 (0.5)	NS
Serum total cholesterol (mmol/l)	4.25 (0.80)	4.40 (0.55)	NS
Serum triglyceride (mmol/l)	1.16 (0.58)	1.12 (0.54)	NS
Clinical features, No (%)			
Oral ulcerations	53 (100)		
Genital ulcerations	32 (60)		
Erythema nodosum	21 (40)		
Papulopustular lesions	44 (83)		
Positive pathergy reaction	28 (53)		
Ocular lesions	12 (23)		
Intestinal lesions	6 (11)		
Peripheral arthritis	14 (26)		
Vascular lesions	9 (17)		
CNS lesions	2 (4)		
Positive HLA-B51	22 (42)		
Active disease	16 (30)		
Severe disease	19 (36)		
Immunosuppressive agents	15 (28)		
Azathioprine	10 (19)		
Ciclosporin	5 (9)		
Corticosteroids	38 (72)		
Pulse wave velocity (m/s)			
Heart-femoral	7.9 (1.1)	7.2 (0.6)	<0.001
Heart-carotid	6.8 (1.5)	6.2 (1.0)	0.035
Heart-brachial	5.4 (0.7)	5.1 (0.6)	0.004
Femoral-ankle	10.4 (1.3)	10.0 (0.9)	0.034

Results are given as mean (SD) unless stated otherwise.
NS. non-significant; CNS, central nervous system.

excluded. At the time of examination the presence of more than two of the following clinical features was considered to indicate active disease: oral ulceration, genital ulceration, skin lesions, ocular lesions, active major vessel disease, and active major organ involvement, including active gastrointestinal or neurological lesions. The presence of severe disease was defined as in the previous investigation.[8] Information was obtained on corticosteroids and immunosuppressant drug use for the 3 months before the start of this study. PWV was measured with an automated device (VP-2000, Colin Co Ltd, Japan) in the heart-femoral, heart-carotid, heart-brachial, and femoral-ankle segments.[9 10]

Table 1 summarises clinical features and cardiovascular variables of the study group. No differences between patients with BD and controls were found for age, sex ratio, other measures known to affect PWV, including height, blood pressure, heart rate, and total cholesterol levels. Patients with BD had significantly higher PWV values than controls in all the four arterial segments.

In the relationship between PWV values and clinical measures of BD in the different regions, it was found in univariate analysis that some clinical variables related to severe manifestations in BD, which included severe disease, male sex, vascular lesions, or immunosuppressant drug use, were partly associated with increased PWV. However, statistical significance for these clinical variables was lost in all the regional arterial segments in multivariate analysis (data not shown). In addition, the PWV levels did not differ significantly between patients with and without active disease. Patients treated with corticosteroids had PWV values similar to those of patients not receiving these drugs. In the Pearson correlation analyses, all the regional PWV levels, except for the femoral-ankle segment, correlated well with increasing age. The PWV values in all the regional arterial segments correlated positively with mean blood pressure (MAP). After adjusting for any confounding factors through multivariate regression analysis, age and MAP remained statistically significant in most regional arterial segments (data not shown). However, none of the regional PWV values correlated with the disease duration.

Patients with BD had significantly higher PWV values in all the four regions than in controls, indicating the presence of increased arterial stiffness. Such increased arterial stiffness may be attributed to endothelial dysfunction and acute or chronic inflammatory processes associated with BD. On the other hand, similar to the well known effects of age and MAP on PWV,[5 6 10] we found that age and MAP were independent significant factors associated with increased PWV in BD. Longitudinal studies in a large group are required to determine the pathophysiological and prognostic implications of increased arterial stiffness in BD.

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REFERENCES

1 **Chambers JC**, Haskard DO, Kooner JS. Vascular endothelial function and oxidative stress mechanisms in patients with Behçet's syndrome. *J Am Coll Cardiol* 2001;**37**:517–20.
2 **Hingorani AD**, Cross J, Kharbanda RK, Mullen MJ, Bhagat K, Taylor M, *et al*. Acute systemic inflammation impairs endothelium-dependent dilatation in humans. *Circulation* 2000;**102**:994–9.
3 **Raza K**, Thambyrajah J, Townend JN, Exley AR, Hortas C, Filer A, *et al*. Suppression of inflammation in primary systemic vasculitis restores vascular endothelial function: lessons for atherosclerotic disease? *Circulation* 2000;**102**:1470–2.
4 **Ridker PM**, Cushman M, Stampfer MJ, Tracy RP, Hennekens CH. Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men. *N Engl J Med* 1997;**336**:973–9.
5 **Izzo JL Jr**. Arterial stiffness and the systolic hypertension syndrome. *Curr Opin Cardiol* 2004;**19**:341–52.
6 **Davies JI**, Struthers AD. Pulse wave analysis and pulse wave velocity: a critical review of their strengths and weaknesses. *J Hypertens* 2003;**21**:463–72.
7 **International Study Group for Behçet's Disease (ISGBD)**. Criteria for diagnosis of Behçet's disease. *Lancet* 1990;**335**:1078–80.
8 **Kim JU**, Chang HK, Lee SS, Kim JW, Kim KT, Lee SW, *et al*. Endothelial nitric oxide synthase gene polymorphisms in Behçet's disease and rheumatic diseases with vasculitis. *Ann Rheum Dis* 2003;**62**:1083–7.
9 **Munakata M**, Ito N, Nunokawa T, Yoshinaga K. Utility of automated brachial ankle pulse wave velocity measurements in hypertensive patients. *Am J Hypertens* 2003;**16**:653–7.
10 **Tomiyama H**, Yamashina A, Arai T, Hirose K, Koji Y, Chikamori T, *et al*. Influences of age and gender on results of noninvasive brachial-ankle pulse wave velocity measurement: a survey of 12517 subjects. *Atherosclerosis* 2003;**166**:303–9.