The usefulness of TC-99m-MDP Bone Scintigraphy In Detection of Articular Involvement of Behçet's Disease

Thesis
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بِسْمِ اللهِ الرَّحْمنِ الرَّحِيمِ

{ وَقُل رَّبِّ زِدْنِي عِلْماً }

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ABSTRACT

Objective:
The present study was performed to study the role of bone scintigraphy in the assessment of articular involvement in patients with Behçet's disease. Correlation with disease activity, disease severity and clinical manifestations was performed.

Patients & Methods:
Twenty five Behçet's disease patients diagnosed according to the criteria published by the International Study Group for Behçet's Disease in 1990 were included in this work and were subjected to the following: Full history taking, clinical examination, routine laboratory tests including CBC, ESR, CRP and conventional radiological examination and bone scintigraphy in the radiodiagnosis and the nuclear medicine departments respectively, Cairo University Hospital. Skin pathergy test was performed.

Results:
Twelve of the 25 patients (48%) showed clinical joint involvement. Rheumatoid-like hand findings were observed in 2 (8%) of the patients.

The most frequently involved site on bone scintigraphy was the wrist (100%) with the decreasing order of frequency as follows: MCPs (64%), PIPs (44%), DIPs (40%), knee (36%), ankle (20%), SIJ (16%) and shoulder, elbow, and MTPs had the same frequency (4%).

All of our patients (100%) revealed hand scintigraphic involvement, 24% of them had mild score, 60% had moderate score and 16% had severe score.

No significant correlation was found between age ($r=0.295$, $p=0.666$), disease duration ($r=0.308$, $p=0.622$), the different disease manifestations and clinical severity score ($p=0.958$) and the hand bone scintigraphy.

Conclusion:
One can conclude that bone scintigraphy can be a useful tool to determine the presence and site of articular involvement. Follow up of our patients to detect development of frank arthritis in patients with subclinical arthritis and further study on a larger number of patients is recommended for confirming the present results and showing the prevalence of articular involvement in Egyptian BD patients.

Keywords: Behçet disease, Bone scintigraphy (BS), Hand scintigraphy.

List of Abbreviations

ANA	**A**nti**n**uclear **a**ntibody
ANCA	**A**nti**n**eutrophil **c**ytoplasmic **a**ntibody
B-cell	**B**one marrow derived cell
BD	**B**ehçet's **d**isease
BS	**B**one **s**can
CC	**β C**hemokine
CCL	**C-C** Chemokine **l**igand
CD	**C**luster of **d**ifferentiation
CMC	**C**arpo**m**eta**c**arpal
CNS	**C**entral **n**ervous **s**ystem
CRP	**C**-**R**eactive **p**rotein
CSF	**C**erebro**s**pinal **f**luid
CT	**C**omputed **t**omography
CXC	**α C**hemokine
CXCL	**C**hemokine **l**igand
DIP	**D**istal **i**nter**p**halangeal
DNA	**D**eoxyribo**n**ucleic **a**cid
DVT	**D**eep **v**enous **t**hrombosis
EN	**E**rythema **n**odosum
ESR	**E**rythrocyte **s**edimentation **r**ate
EULAR	**Eu**ropean **L**eague **A**gainst **R**heumatism
Hb	**H**aemoglobin
HLA	**H**uman **l**eucocytic **a**ntigen
HSP	**H**eat **s**hock **p**rotein
HSV	**H**erpes **s**implex **v**irus
HSV1	**H**erpes **s**implex **v**irus type I

ICAM-1	**I**ntra**c**ellular **a**dhesion **m**olecule-1
IC	**I**nter **c**arpal
IgA	**I**mmuno**g**lobulin **A**
IgG	**I**mmuno**g**lobulin **G**
IgM	**I**mmuno**g**lobulin **M**
IL	**I**nter**l**eukin
IL-1	**I**nter**l**eukin 1
IL-1ra	**I**nter**l**eukin-1**r**eceptor **a**ntagonist
IL-4	**I**nter**l**eukin 4
IL-6	**I**nter**l**eukin 6
IL-8	**I**nter**l**eukin 8
IL-10	**I**nter**l**eukin 10
IL-13	**I**nter**l**eukin 13
IL-18	**I**nter**l**eukin 18
IFNα	**I**nter**f**eron **alpha**
IFNγ	**I**nter**f**eron **gamma**
IM	**I**ntra**m**uscular
ISG	**I**nternational **S**tudy **G**roup
MCP	**M**eta**c**arpo**p**halangeal
MDP	**M**ethylene **d**i **p**hosphonate
MMP-3	**M**atrix **M**etallo**p**roteinase-3
MRI	**M**agnetic **r**esonance **i**mage
MU	**M**icro **u**nite
MTP	**M**eta**t**arso**p**halangeal
n	**N**umber
NSAID	**N**on-**s**teroidal **a**nti-**i**nflammatory **d**rugs
PC	**P**rotein **C**
PIP	**P**roximal **i**nter**p**halangeal

PMN	**P**oly**m**orph **n**uclear cells
QSS	**Q**uantitative **s**acroiliac **s**cintigraphy
RA	**R**heumatoid **a**rthritis
RF	**R**heumatoid **f**actor
SC	**S**ub**c**utaneous
SD	**S**tandard **d**eviation
sIL-2r	**S**oluble **i**nter**l**eukin-2 **r**eceptors
SIJ	**S**acro**i**liac **j**oint
SLE	**S**ystemic **L**upus **E**rythmatosis
SPECT	**S**ingle **P**hoton **E**mission **C**omputed **T**omography
SPT	**S**kin **p**athergy **t**est
Tc-99	**T**echni**c**hium-99
T-cell	**T**hymus derived cell
TH-1	**T h**elper cell
TGF	**T**ransforming **g**rowth **f**actor
TNF	**T**umour **n**ecrosis **f**actor
WBC	**W**hite **b**lood **c**ell

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INTRODUCTION AND AIM OF WORK

Introduction

Behçet's disease (BD) is a chronic inflammatory disorder of unknown etiology, classified among vasculitides which may involve both arteries and veins of all sizes from different systems. Behçet's disease is now recognized as multisystemic disease with various organ involvement including skin, mucous membrane, eyes, joints, vessels, gastrointestinal tract and nervous system ***(Jorizzo, 1993)***.

Although, arthritis has not been included in international study group criteria ***(ISG, 1990)***, arthritis and / or arthralgia is one of the most frequent manifestations of Behçet's disease ***(Yurdakul et al., 1983)***.

Articular involvement was reported to be present in approximately 5-76% of Behçet patients ***(Al-Mutawa and Hegab, 2004).***

Small and large joints and tendon enthesis can be involved in patients with Behçet's disease ***(Kim et al., 1993).***

^{99m}TC–methylene diphosphonate (TC-99m-MDP) bone scintigraphy has the advantage of being non- invasive method which can detect early sub clinical articular involvement in Behçet patients ***(Yapar et al., 2001).***

Bone scintigraphy is sensitive in early diagnosis of joint involvement especially in patients with mild or no symptoms and having normal plain radiographic findings ***(Prakash et al., 1983)***.

Aim of Work

This study was performed to evaluate the utility of Tc-99m-MDP bone scintigraphy in the detection of articular involvement in patients with Behçet's disease and to correlate the articular involvement as detected by bone scintigraphy with clinical manifestations, disease severity as well as with disease activity.