



E Malchiodi ^{1,2}, E Sala ^{1,2}, E Verrua ^{1,2}, E Cairoli ^{1,2}, E Carosi ^{1,2}, E Ferrante ², M Filopanti ², F M Ulivieri ³, C Eller-Vainicher ², I Chiodini ², G Mantovani ^{1,2}, A Spada ^{1,2}

1. Department of Clinical Sciences and Community Health, University of Milan;
2. Endocrinology and Diabetology Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan
3. Nuclear Medicine Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan

GP-19-02

Introduction

Acromegaly is characterized by chronic exposure to high GH and IGF-I levels that leads to increased bone turnover. **Regardless of BMD value, acromegalic patients seem to have an increased vertebral fracture risk probably due to a reduction of bone quality.**

Aim of the study

To describe bone mass and quality in 16 acromegalic patients. Trabecular Bone Score (TBS) was used for the first time to analyze bone quality in acromegaly. **TBS is a new gray-level textural metric that can be extracted from the 2-dimensional lumbar spine DXA image to estimate trabecular microstructure.**

Patients and methods

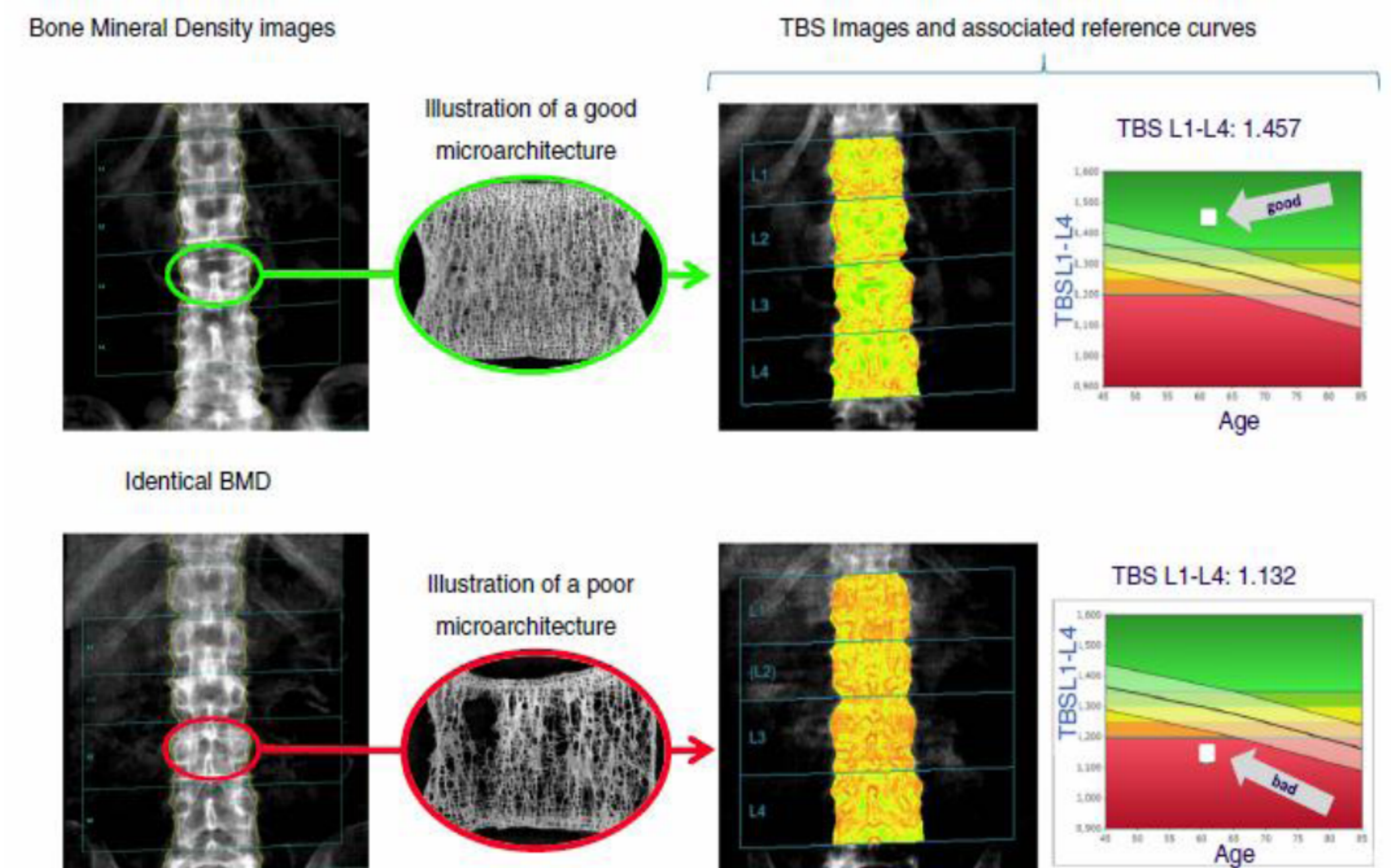
56% of patients had a macroadenoma, 18% had hypopituitarism (all hypoadrenalism) and nobody had cosecretion.

	Patients	Controls	P
Female	12/16	12/16	NS
Age	56.3 ± 13.8	58.2 ± 11.7	NS
BMI	28.1 ± 6.3	26.7 ± 4.2	NS

Patients with MEN1, ectopic GHRH secretion and history of secondary osteoporosis were excluded.

All participants underwent: vertebral RX
lumbar spine and femur DEXA

TBS was assessed in the region of LS-BMD.



Results

	Patients	Controls	P
LS T-score	-0.5 ± 1.3	-0.7 ± 1.0	NS
LS Z-score	0.5 ± 1.3	0.5 ± 1.5	NS
FN T-score	-0.6 ± 0.9	-0.7 ± 1.2	NS
FN Z-score	0.3 ± 0.7	0.2 ± 0.8	NS
FT T-score	0.02 ± 1.01	-0.5 ± 0.99	NS
FT Z-score	0.64 ± 0.84	0.4 ± 0.8	NS
TBS Z-score	-2.27 ± 2.05	-1.00 ± 0.9	0.04
Vertebral fractures	12.5% (2/16)	6.5% (1/16)	NS

In acromegalic patients, at bivariate analysis

TBS was associated with:

- age at diagnosis (r^2 -0.25, P 0.04)
- GH serum levels (r^2 0.36, P 0.01)
- FN T-score (r^2 0.35, P 0.02)
- FN Z-score (r^2 0.81, P 0.01)

Vertebral fractures were associated with:

- age at diagnosis (r^2 0.36, P 0.02)

LS-BMD and FT-BMD were related to:

- alteration of glucose metabolism (r^2 0.25, P 0.04 and r^2 0.49, P 0.002 respectively).

Conclusion

Acromegalic patients had impaired bone quality despite normal bone density. Further larger studies are needed to define TBS role in fracture risk in acromegaly.

References

1. Ulivieri FM, Silva BC, Sardanelli F, Hans D, Bilezikian JP, Caudarella R. Utility of the trabecular bone score (TBS) in secondary osteoporosis. *Endocrine* 2014 47:435-448
2. Mazziotti G, Biagioli E, Maffezzoni F, Spinello M, Serra V, Maroldi R, Floriani I, Giustina A. Bone turnover, bone mineral density and fracture risk in acromegaly: a meta-analysis *J Clin Endocrinol Metab.* 2015;100(2):384-94