

available at [www.sciencedirect.com](http://www.sciencedirect.com)  
journal homepage: [www.europeanurology.com](http://www.europeanurology.com)



European Association of Urology



## Case Study of the Month

# Complete Response to the Combination Therapy with Androgen Blockade and Somatostatin Analogue in a Patient with Advanced Prostate Cancer: Magnetic Resonance Imaging with 1H-Spectroscopy

Sciarra Alessandro<sup>a,\*</sup>, Panebianco Valeria<sup>b</sup>, Ciccariello Mauro<sup>b</sup>, Salciccia Stefano<sup>a</sup>, Gentilucci Alessandro<sup>a</sup>, Lisi Danilo<sup>b</sup>, Passariello Roberto<sup>b</sup>, Gentile Vincenzo<sup>a</sup>, Di Silverio Franco<sup>a</sup>

<sup>a</sup>Department of Urology, University La Sapienza, Rome, Italy

<sup>b</sup>Department of Radiology, University La Sapienza, Rome, Italy

### Article info

#### Article history:

Accepted February 7, 2007

Published online ahead of print on ●●●

#### Keywords:

Hormone therapy  
Magnetic resonance  
Neuroendocrine  
Prostate neoplasms  
Somatostatin analogue  
Spectroscopy

**EU \* ACME**

[www.eu-acme.org/](http://www.eu-acme.org/)  
[europeanurology](http://europeanurology.com)

### Abstract

A 74-yr-old man with prostatic adenocarcinoma underwent magnetic resonance 1H-spectroscopic imaging (1H-MRSI) of the prostate. Based on the results, he was treated with combination therapy using complete androgen blockade (leuprorelin acetate 3.75 mg every 4 wk plus bicalutamide 50 mg daily) and a somatostatin analogue (lanreotide acetate 60 mg every 4 wk). Serum prostate-specific antigen and chromogranin A levels steadily decreased over a 12-mo follow-up period, at which time the patient is alive without disease progression and with a complete objective and symptomatic response.

© 2007 Published by Elsevier B.V. on behalf of European Association of Urology.

\* Corresponding author. Via Nomentana 233, 00161 Rome, Italy. Tel. +(00)39 06 44237970; Fax: +(00)39 06 4461959.

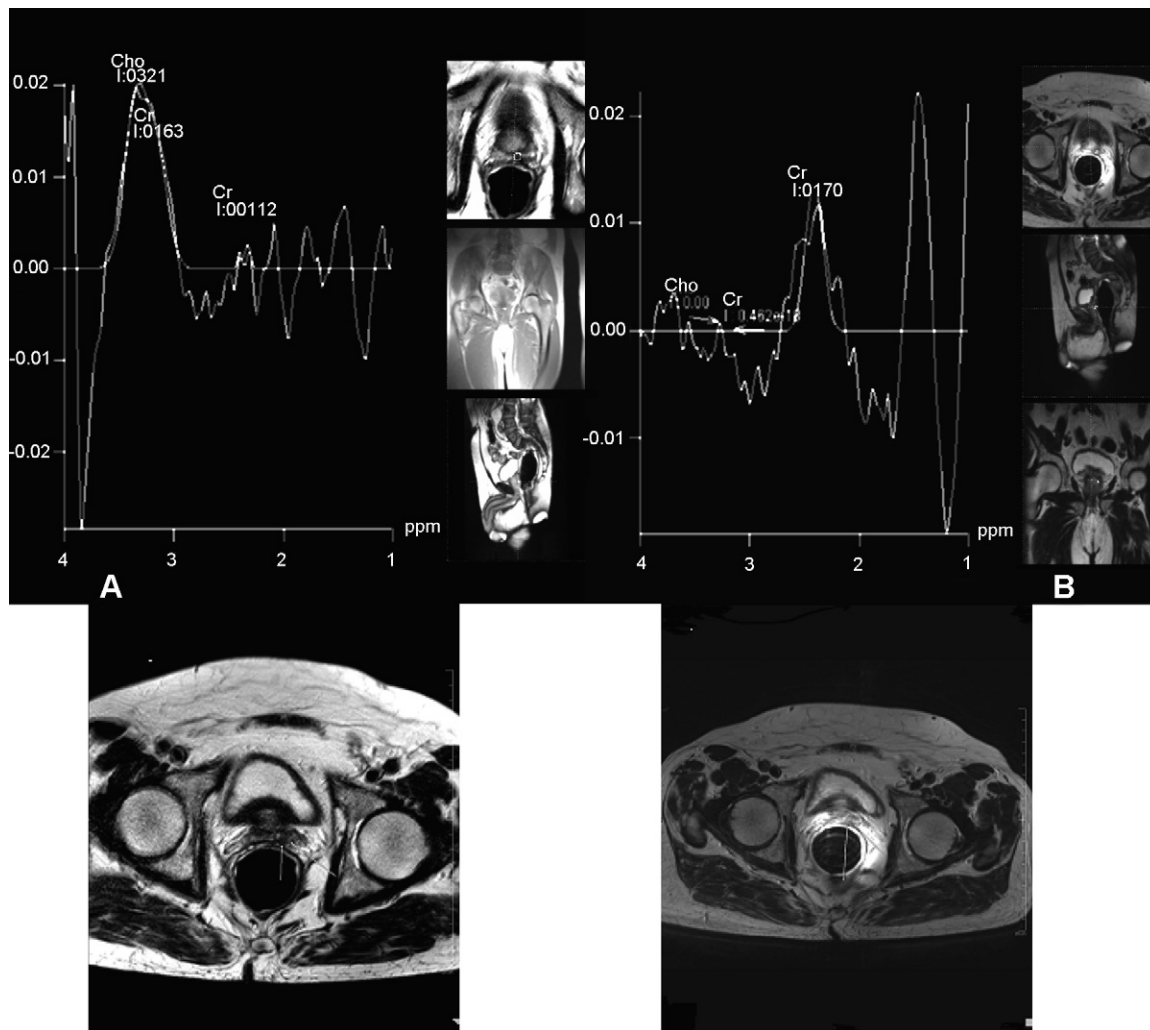
E-mail address: [sciarrajr@hotmail.com](mailto:sciarrajr@hotmail.com) (S. Alessandro).

## 1. Case history

In October 2005, a 74-yr-old man was diagnosed at prostate biopsy as having prostatic adenocarcinoma with a Gleason score 7 (4 + 3); his serum prostate-specific antigen (PSA) level was 680 ng/ml and the determination of serum chromogranin A (CgA, 121 ng/ml; normal, <90 ng/ml) suggested neuroen-

docrine (NE) activity. Performance status (Eastern Cooperative Oncology Group) score was 3 and the bone pain and analgesic requirement score was 3. A bone scan showed several areas of diffuse skeletal metastases (Fig. 1A). In October 2005, the patient had a magnetic resonance 1H-spectroscopic imaging (1H-MRSI) of the prostate (Fig. 2A). The 1H-MRSI showed an area of low signal intensity (1.8 cm)

0302-2838/\$ – see back matter © 2007 Published by Elsevier B.V. on behalf of European Association of Urology. doi:10.1016/j.eururo.2007.02.010



**Fig. 1** – Radionuclide bone scan with  $^{99m}\text{Tc}$ . (A) At diagnosis, areas of abnormal uptake of the radioactive marker were detected in the sacral, dorsal, and cervical segments of the spinal cord, right iliac crest, and chest bilaterally. (B) At response to combination therapy, normal or significant reduction of the radionuclide uptake was found in all the areas described at diagnosis, in particular, in the right iliac crest, sacral and dorsal segments of the spinal cord, and chest bilaterally.

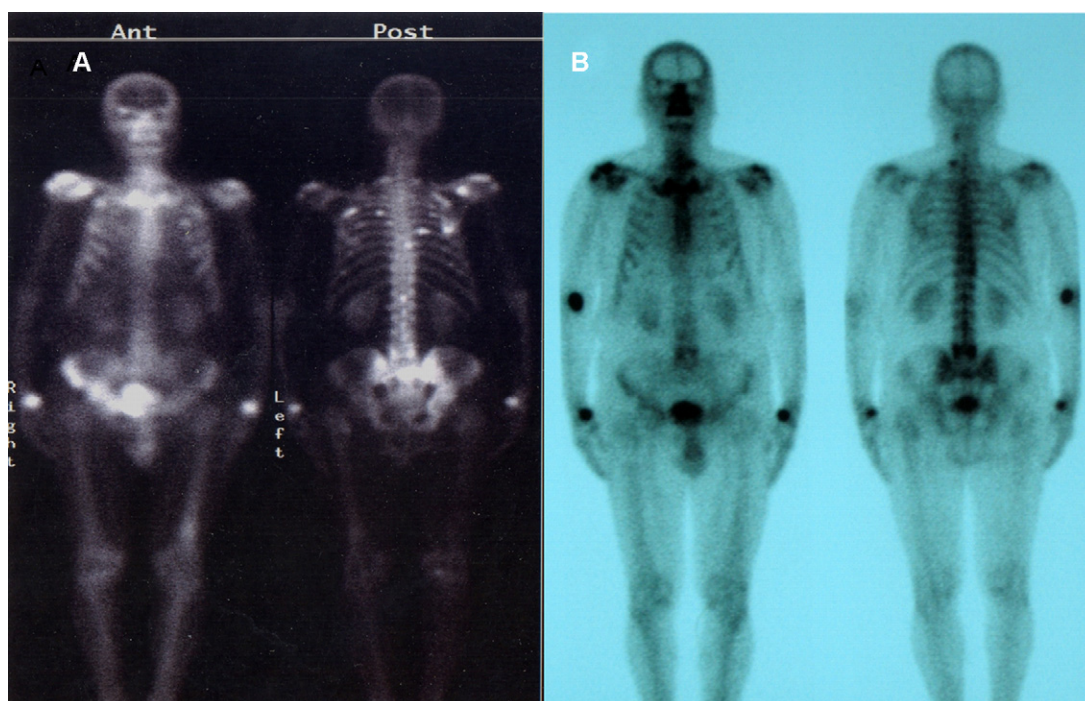
33 involving the left lobe of the prostate and infiltrating  
 34 the left seminal vesicle (Fig. 2A). At spectroscopy,  
 35 in this area the metabolic ratio modification was  
 36 highly suggestive for neoplastic tissue (choline +  
 37 creatine/citrate > 1; Fig. 2A). Considering that the  
 38 patient was at first treatment and on the basis of  
 39 a possible NE activation at the prostate adenocarci-  
 40 noma level, he underwent (November 2005) com-  
 41 bination therapy using complete androgen blockade

(CAB; leuprorelin acetate 3.75 mg every 4 wk plus  
 42 bicalutamide 50 mg daily) and a somatostatin  
 43 analogue (lanreotide acetate 60 mg every 4 wk).  
 44 After 2 mo of combination therapy (January 2006),  
 45 PSA and CgA levels were 0.09 ng/ml and 82 ng/  
 46 ml, respectively. At follow-up, the reduction of  
 47 serum PSA and CgA levels progressively continued  
 48 (PSA nadir = 0.05 ng/ml at 6 mo; CgA nadir = 9 ng/ml  
 49 at 12 mo; Table 1). After 6 mo of therapy (May 2006),  
 50

**Table 1** – Serum PSA and CgA variations at different intervals of follow-up during therapy

	Baseline	1-mo FU	2-mo FU	3-mo FU	6-mo FU	12-mo FU
PSA, ng/ml	680	102	0.09	0.07	0.05	0.05
CgA, ng/ml	121	106	82	70	48	9

FU = follow-up; PSA = prostate specific antigen; CgA = chromogranin A.



**Fig. 2 – Magnetic resonance 1H-spectroscopic imaging (1H-MRSI; Magnetom Avanto, Siemens Medical Solutions, Erlangen, Germany) of the prostate, equipped with surface phased-array and endorectal coil. Imaging protocol: transverse spin-echo T2-weighted sequences on the axial, sagittal, and coronal planes for the morphologic imaging and three-dimensional chemical shift imaging (CSI) sequence with spectral/spatial pulses optimised for quantitative detection of choline and citrate (spectral resolution of 0.28 cm<sup>3</sup>). (A) At diagnosis: transverse fast spin-echo T2-weighted MRI (5000/99 [effective]) showed an area of low signal intensity of 18 mm in the left middle region of the prostate involving the left seminal vesicle (arrows). Selected MR spectra obtained in this area showed a the metabolic ratio modification (choline + creatine/citrate > 1); these findings were suggestive of neoplastic tissue. (B) At response to therapy: transverse fast spin-echo T2-weighted MRI (5000/99 [effective]) showed a reduction (50%) of the low signal intensity area in the left middle region of the prostate and no seminal vesicle involvement (arrows). MR spectra obtained in this area demonstrated normalisation of the metabolic ratio (choline + creatine/citrate < 0.5).**

an objective complete response to therapy was demonstrated by a normal PSA level (PSA = 0.05 ng/ml) and bone scan imaging (Fig. 1B) response. At the 12-mo follow-up (November 2006) the normal serum markers (PSA = 0.05 ng/ml, CgA = 9 ng/ml) were accompanied by a 1H-MRSI response (Fig. 2B). In particular, the normal choline plus creatine-to-citrate ratio (<0.2) at 1H-MRSI confirmed a complete response to the combination therapy at the prostate level. The clinical response was associated with concomitant normal ECOG (1 score) and bone pain scores (0 score), beginning at 2 mo of follow-up. Therefore, after 12 mo of follow-up the patient is alive without disease progression and with a complete objective and symptomatic response.

### Conflicts of interest

Authors disclose any commercial relationship such as: consultancies, stock ownership or other equity

interests, patents received and/or pending, or any commercial relationship which might be in any way considered related to the submitted article.

### EU-ACME question

Please visit [www.eu-acme.org/europeanurology](http://www.eu-acme.org/europeanurology) to answer the below EU-ACME question on-line (the EU-ACME credits will then be attributed automatically). The answer will be given in *Case Study of the Month: Part 2*, which will be published in next month's issue of *European Urology*.

#### Question:

Neuroendocrine differentiation could be considered one of the factors related to the progression of prostate adenocarcinoma in hormone-refractory disease. How has it been proposed to manage this neuroendocrine hyperactivation in prostate cancer?

- A. To continue complete androgen blockade (CAB).
- B. To discontinue androgen-deprivation therapy and start chemotherapy.
- C. To discontinue androgen-deprivation therapy and start somatostatin analogues.
- D. To add a somatostatin analogue to androgen-deprivation therapies.

72  
73

UNCORRECTED PROOF