The ROYAL MARSDEN
NHS Foundation Trust

SBRT for Spine Oligomets

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NHS

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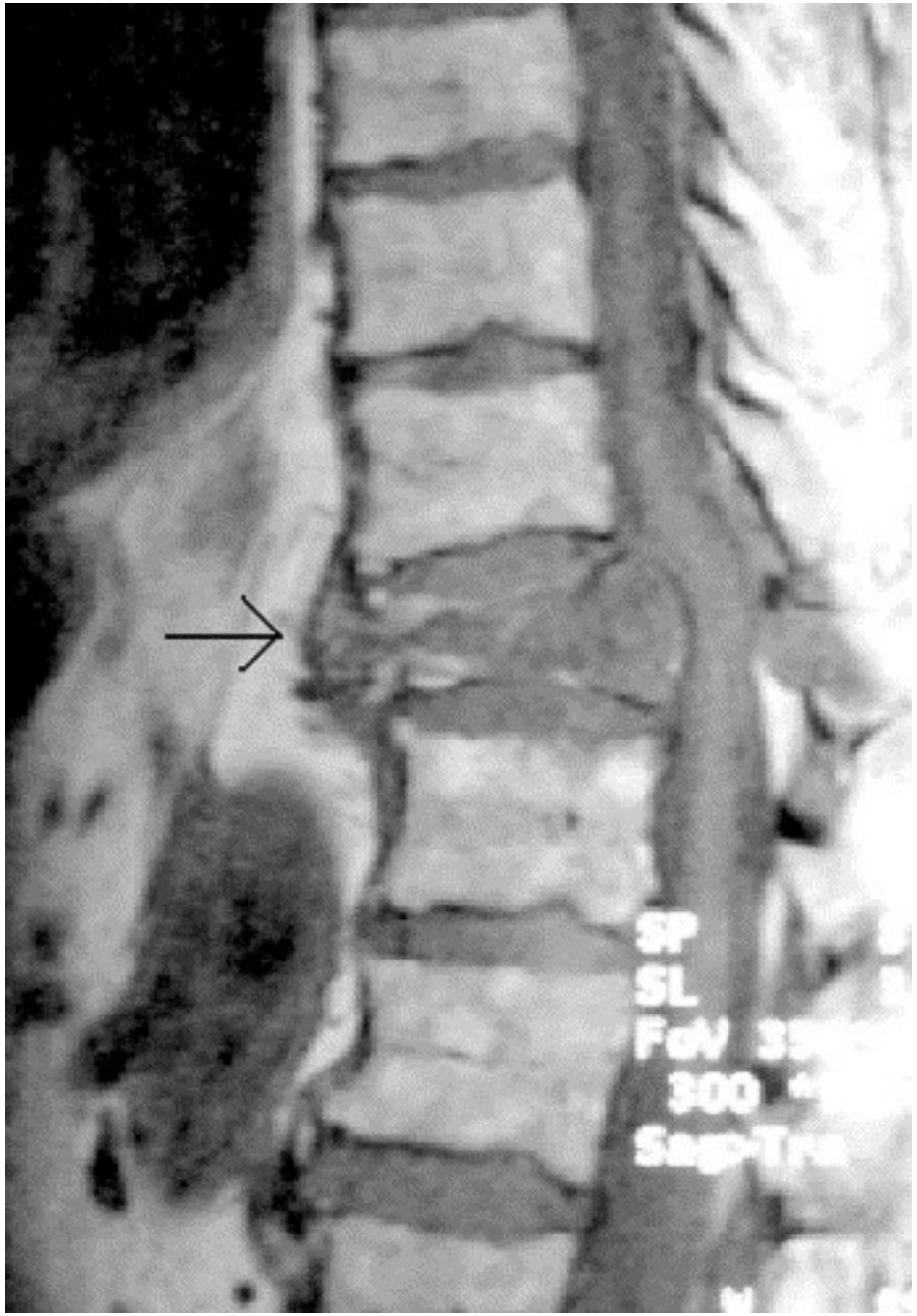
Outline:

Brief overview of spine SBRT

Show 4 different case scenarios using SBRT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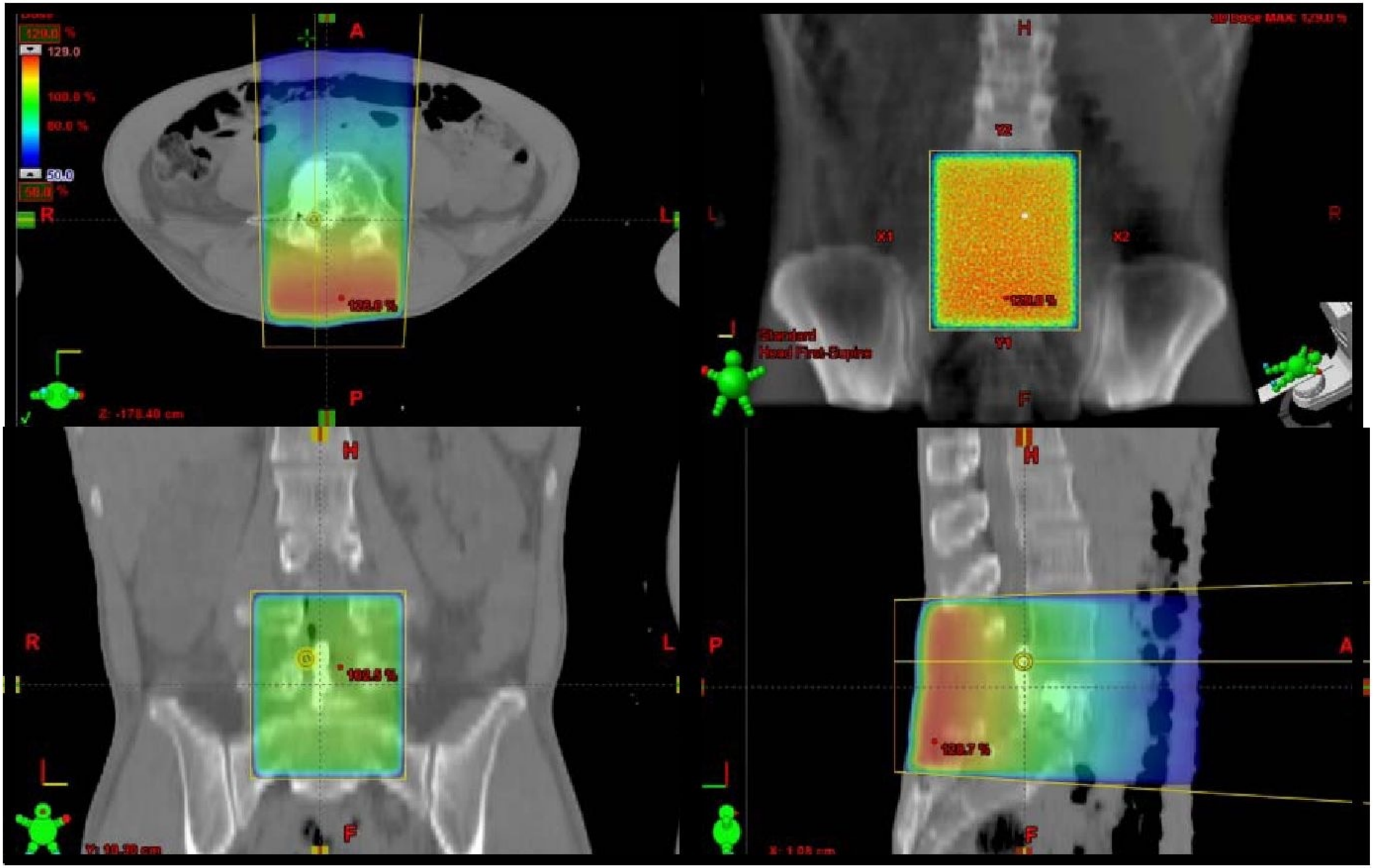
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Z: -178.40 cm
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Head First-Supine
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X2
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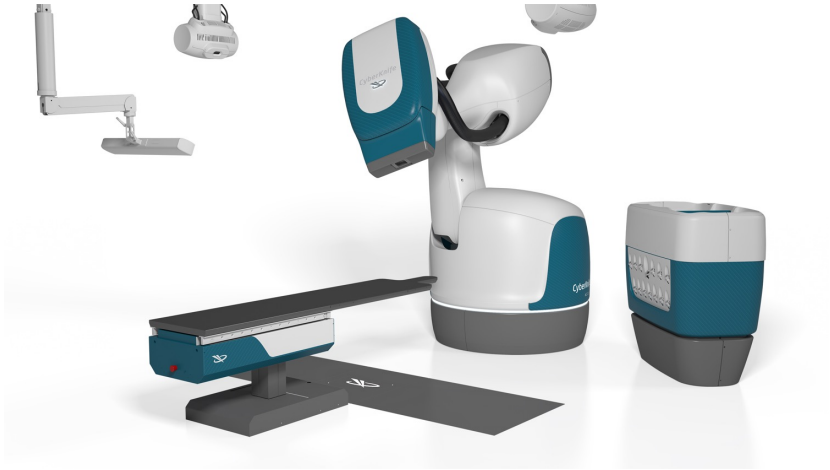
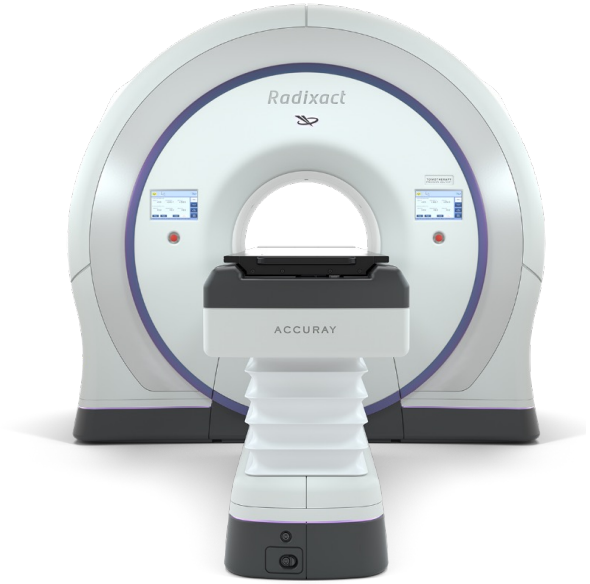
Y2
Y: 10.20 cm
X: 1.05 cm

So what has changed?

Modern PET and MRI allows us to detect disease earlier

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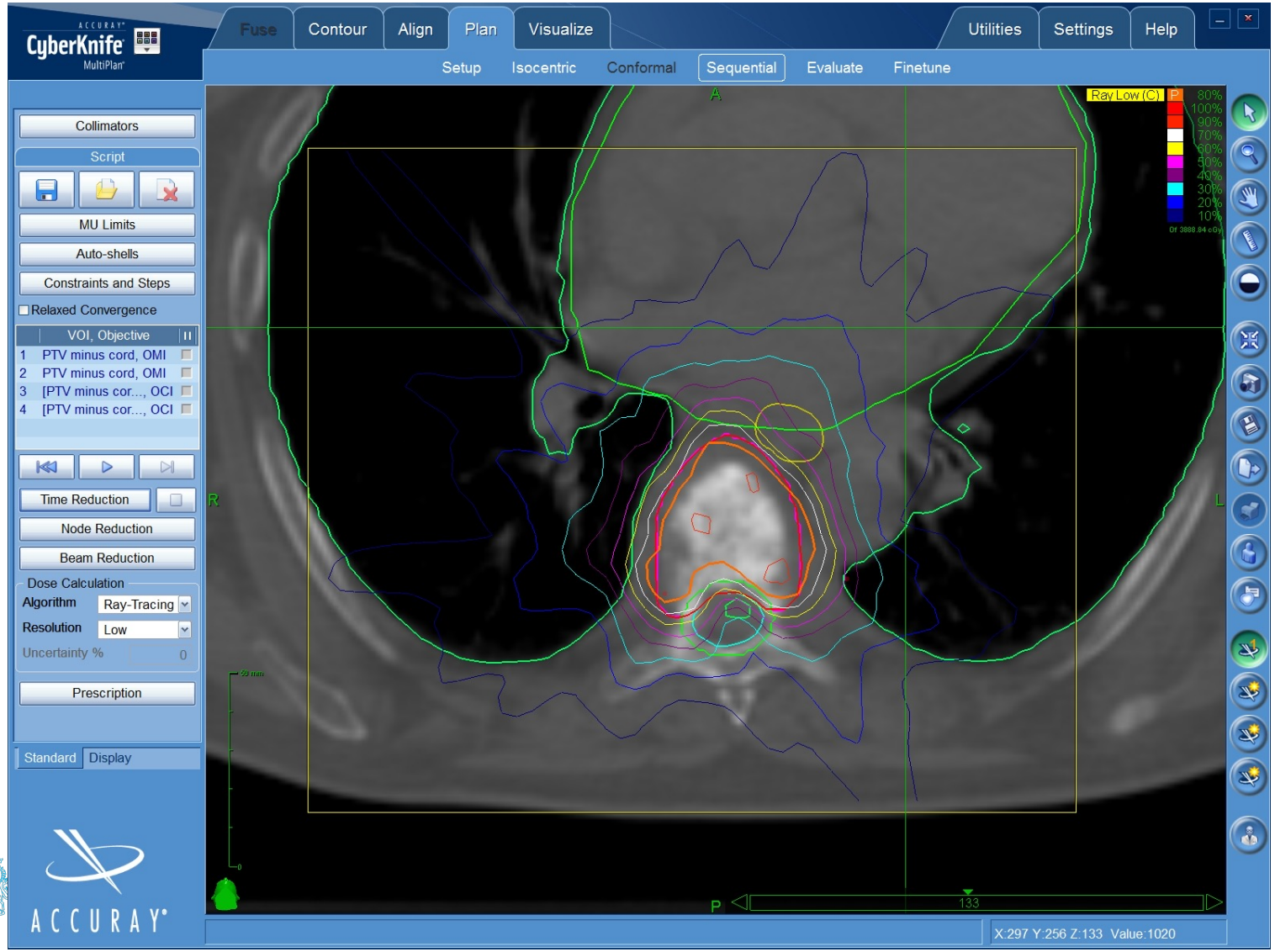
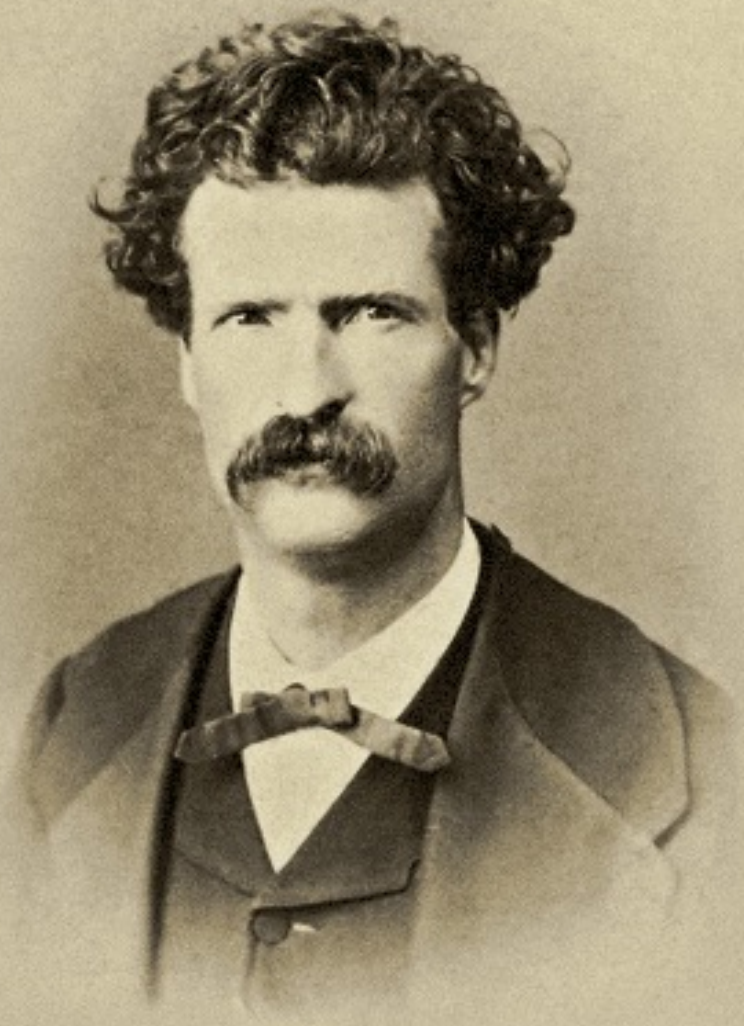


But,.. just because we can see them and have fancy machines, is it enough to justify treatment??

"To a man with a hammer
everything looks like a nail"

- Mark Twain



New ESTRO Guidelines

Radiotherapy and Oncology 190 (2024) 109966

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Guidelines

ESTRO clinical practice guideline: Stereotactic body radiotherapy for spine metastases

M Guckenberger [a,*], N Andratschke [a], C Belka [b,c,d], D Bellut [e], F Cuccia [f], M Dahele [g], RS Guninski [a], M Josipovic [h,i], P Mancosu [j], G Minniti [k,s], M Niyazi [t], U Ricardi [l], P Munck af Rosenschold [m], A Sahgal [n], Y Tsang [o], WFAR Verbakel [p], F Alongi [q,r]

4 key questions

1) What is the overall pain response rate, complete pain response rate and duration of pain response after SBRT for painful vertebral metastases? How does pain response after SBRT compare to conventional palliative radiotherapy?

2) What is the local control (LC) after SBRT for spine metastases? What is the role of spine SBRT in oligo-metastatic disease (OMD)?

3) What is the practice of spinal SBRT to optimize safety and efficacy according to available evidence?

4) What is the toxicity profile of spine SBRT?

New ESTRO Guidelines

In the majority of cases, the level of evidence supporting the recommendations and statements was moderate or expert opinion, only, indicating that spine SBRT is still an evolving field of clinical research.

Enrollment of patients into well-designed prospective clinical trials addressing clinically relevant questions is therefore considered important.

Evidence for SBRT vs cRT (local control)

Singh (2020), review and meta-analysis of outcomes for patients with spinal metastases treated with single-fraction (SF-SRS), multiple-fraction (MF-SRS) or conventional radiotherapy (RT)

Included 3237 patients with 4911 lesions from 37 studies.

Local Contral (LC) outcomes:

1 year LC: SF-SRS resulted in improved 1-year LC (92.9% (95% CI: 86.4–97.4%); p = 0.007) compared to RT (81.0% (95% CI: 69.2–90.5%)) with no difference between MF- SRS (82.1%; p = 0.86) and RT

A 4.7% increase in LC was noted for each 10 Gy10 increase in biologically effective dose (BED10, assuming an alpha/beta = 10) with SRS ($p < 0.001$).

Singh et al. Radiother Oncol, 146, 76-89, (2020)

Evidence for SBRT vs cRT (pain relief)

Sahgal et al. Phase II/III randomized controlled trial. Included 229 patients from 13 hospitals in Canada and Australia.

Randomly assigned (1:1) to SBRT (24 Gy in 2 daily fractions) or conventional RT (cRT) (20 Gy in 5 daily fractions)

At 3 months 35% of pts in SBRT group and 14% of patients in cRT group (p=0·0002) had complete pain response

The most common grade 3–4 adverse event was grade 3 pain: 4% of patients in the cRT group vs 5% of patients in the SBRT group.

No treatment-related deaths were observed.

Sahgal, Lancet Oncol, 22(7), 1023-1033, (2021)

With QA, and training, and in appropriately selected patients

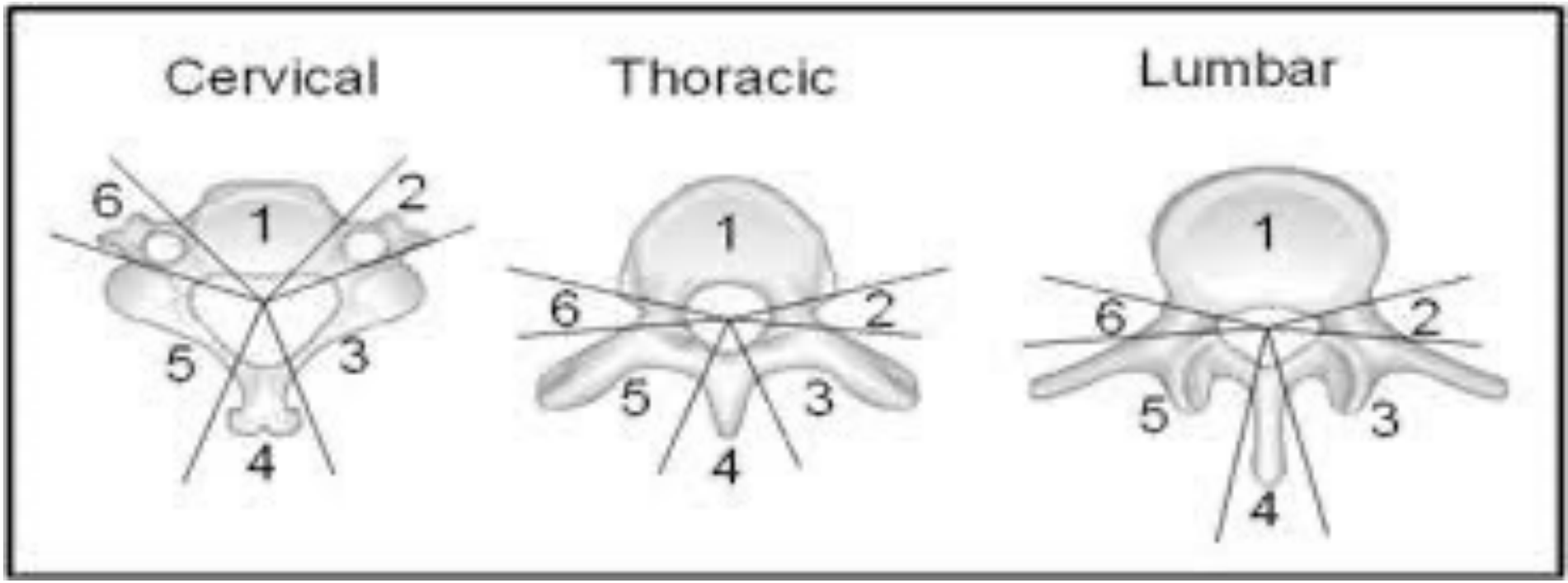
SBRT is effective and safe

How to do it

International Spine Radiosurgery Consortium consensus guidelines for target volume definition in spinal stereotactic radiosurgery

Brett W Cox [1], *Daniel E Spratt*, *Michael Lovelock*, *Mark H Bilsky*, *Eric Lis*, *Samuel Ryu*, *Jason Sheehan*, *Peter C Gerszten*, *Eric Chang*, *Iris Gibbs*, *Scott Soltys*, *Arjun Sahgal*, *Joe Deasy*, *John Flickinger*, *Mubina Quader*, *Stefan Mindea*, *Yoshiya Yamada*

Int J Radiat Oncol Biol Phys
. 2012 Aug 1;83(5):e597-605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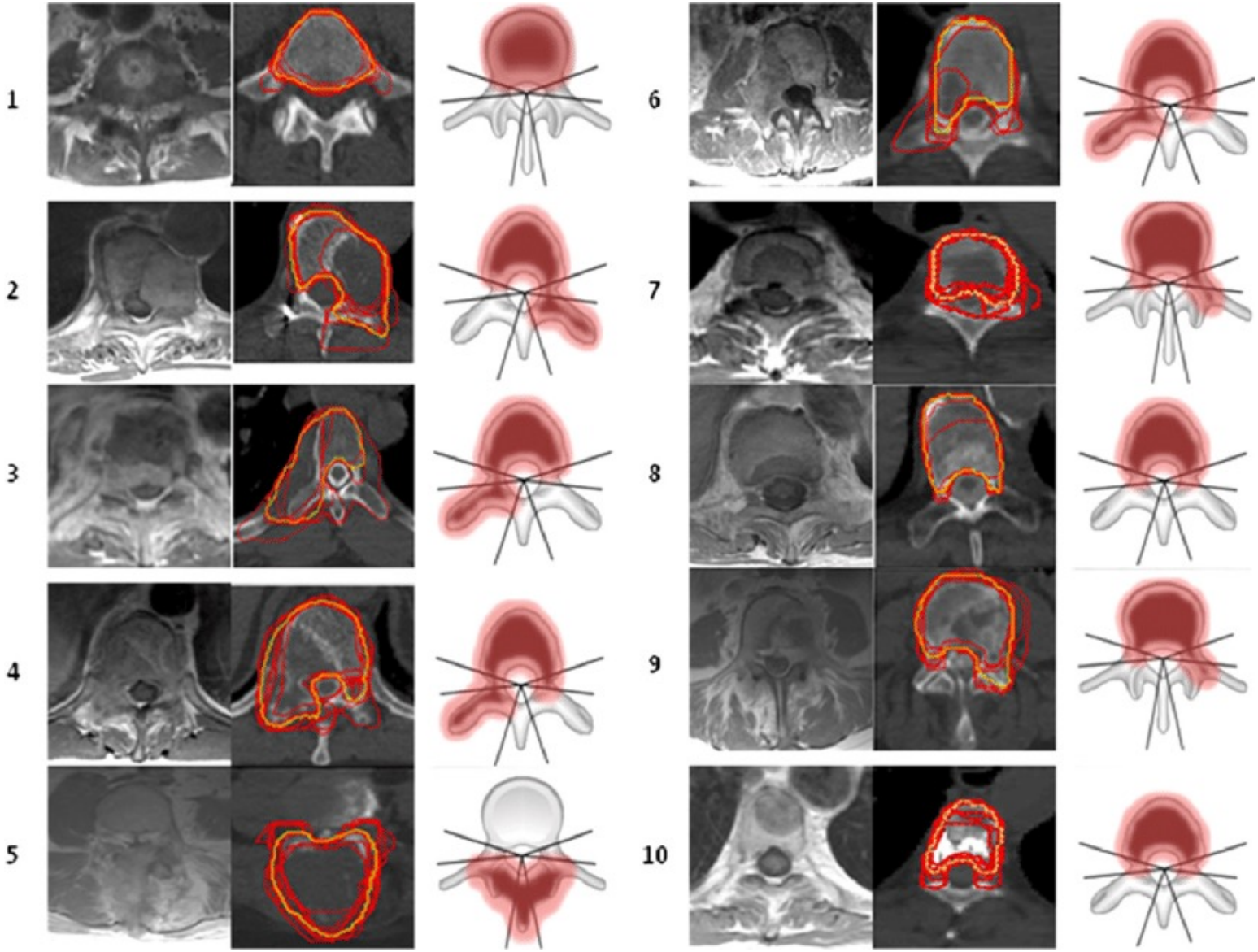
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Some clinical cases

Case 1(Solitary, good PS)

- 63M
- Local treatment for T3b Gl 9 Ca prostate
- 4 years later: PSA 10 – MRI: isolated C7 metastasis


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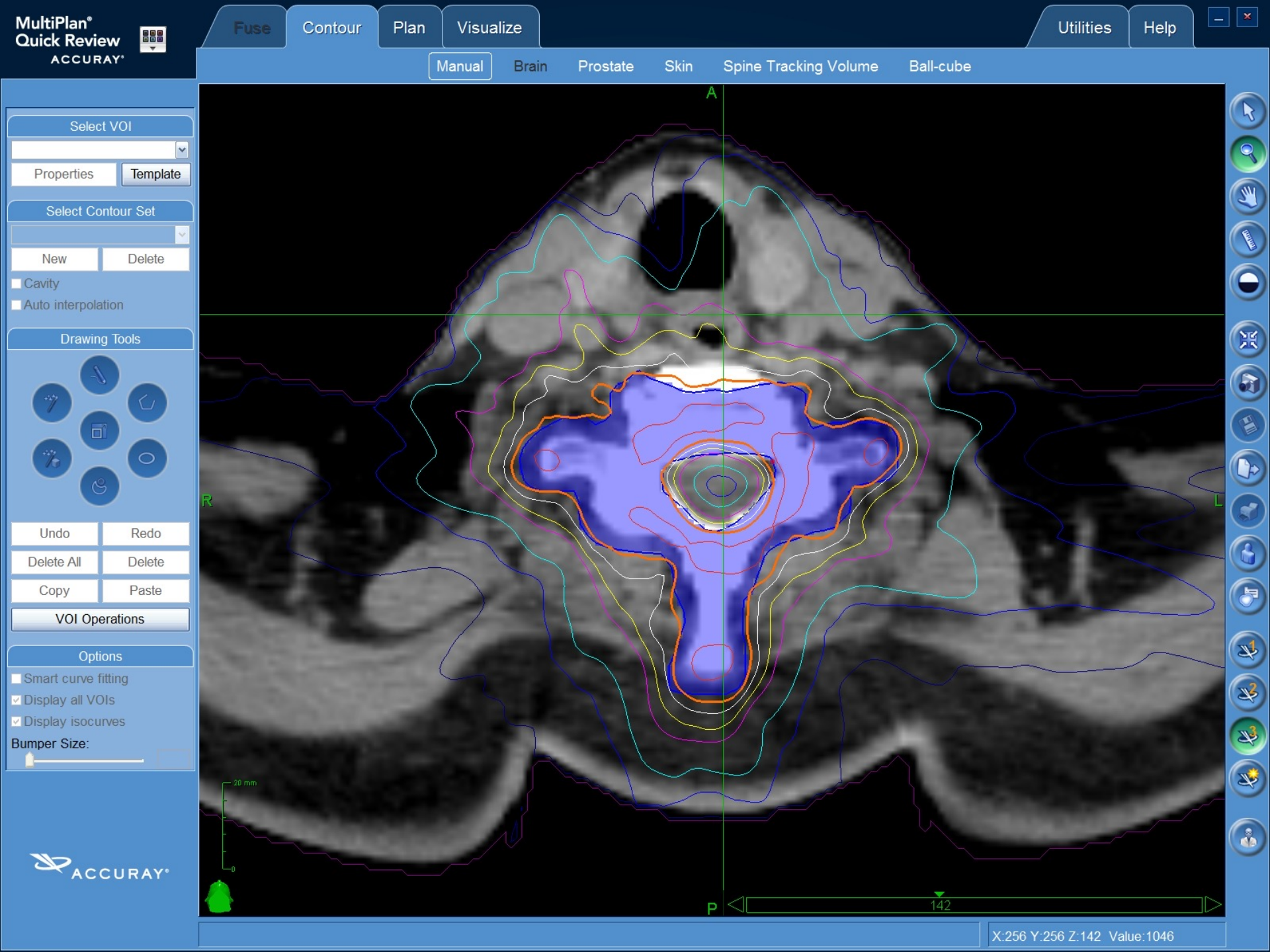
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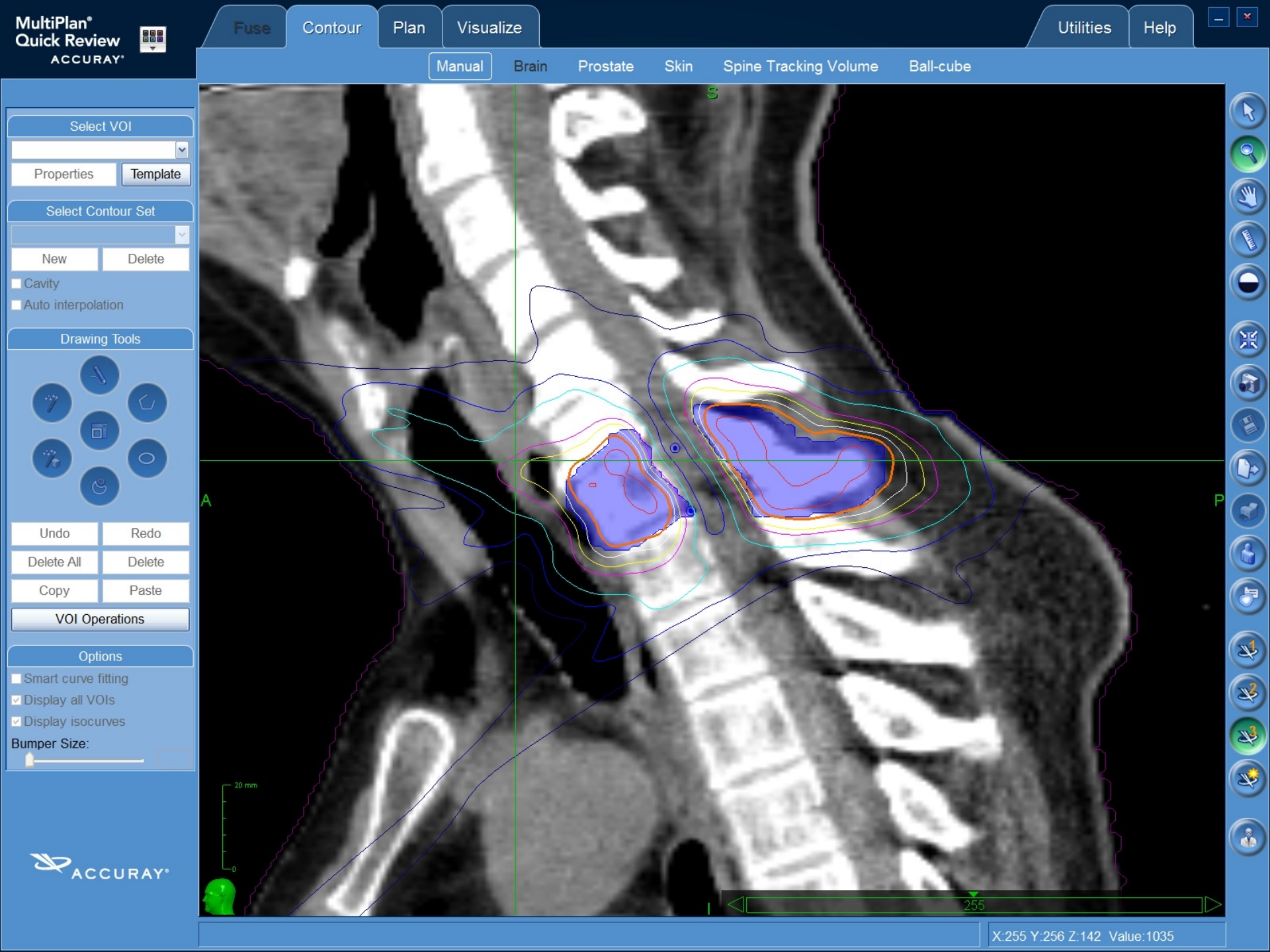
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Delete All
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X:255 Y:256 Z:142 Value:1035
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Case 1

SBRT to C7 – 27 Gy / 3# (6 months LHRHa)

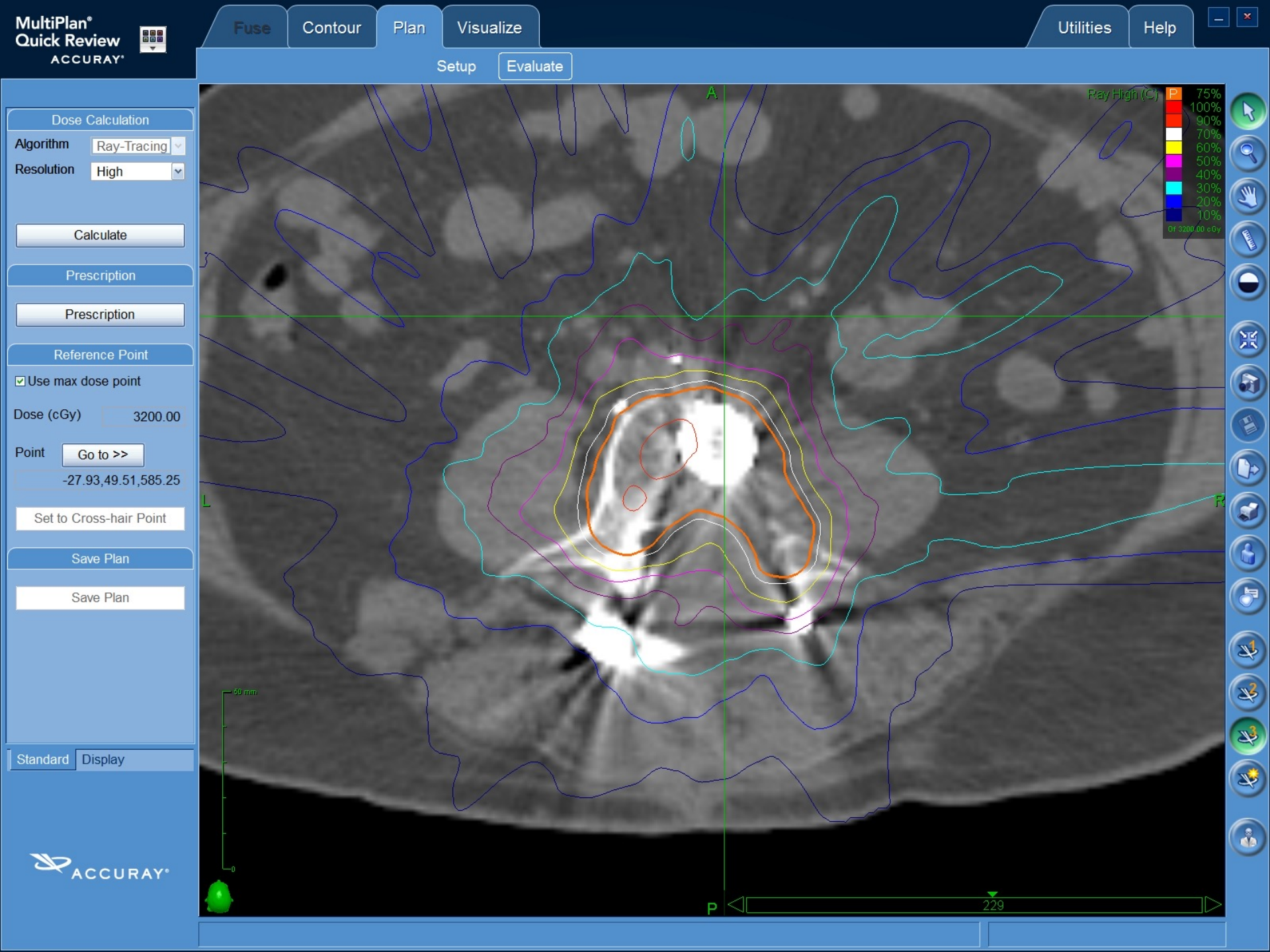
Patient did not want long term LHRHa

3 years later– remained off LHRHa

No evidence of biochemical or imaging progression

Case 2 (Post surgery residual disease)

- 66M
- Renal primary (RCC) + isolated L4 bone met
    - Nephrectomy
    - L4 vertebrectomy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Use max dose point
Dose (cGy)
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Go to >>
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Set to Cross-hair Point
Save Plan
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100%
90%
70%
60%
50%
40%
30%
20%
10%
Of 3200.00 cGy
50 mm
0
229

Case 2

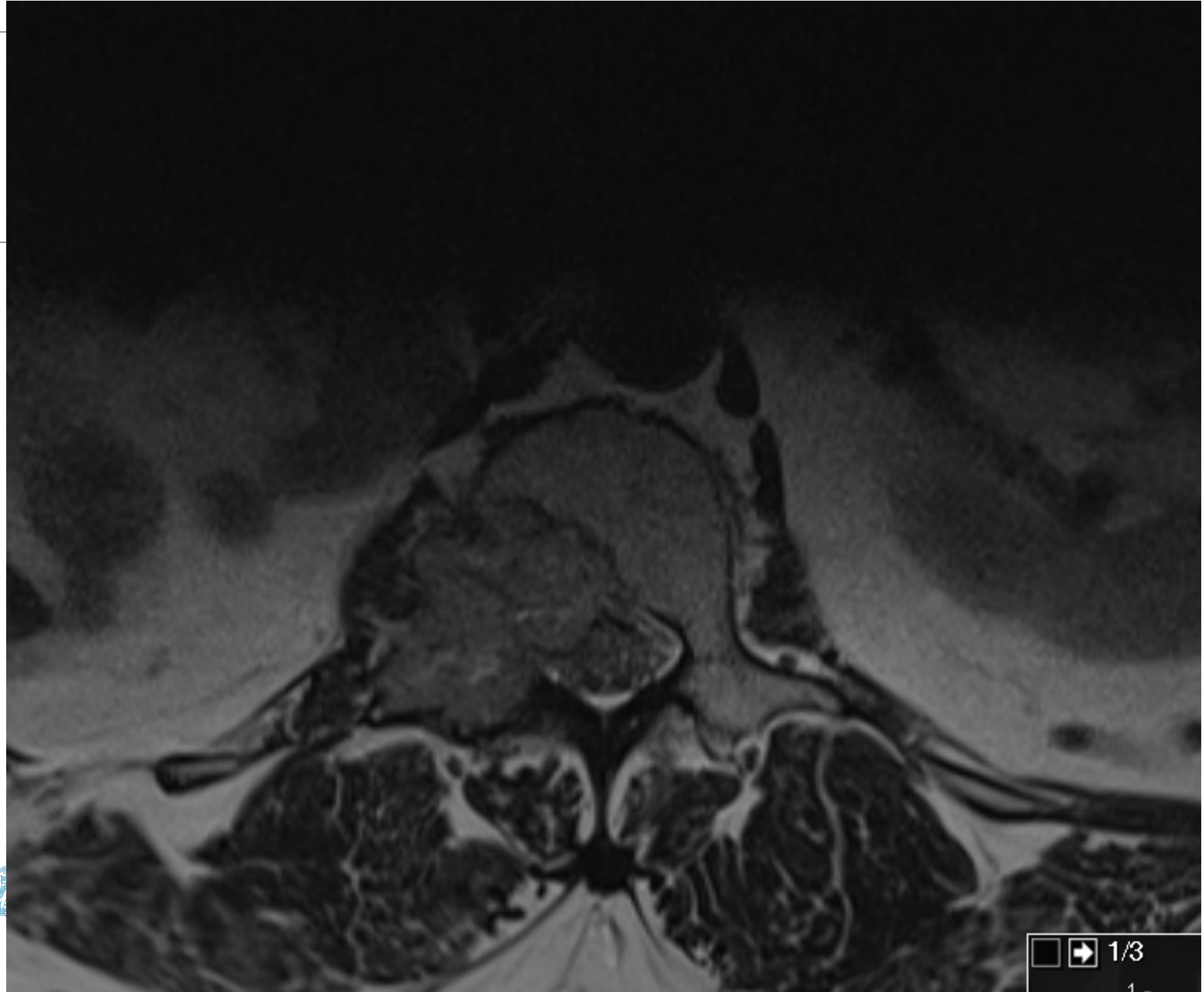
SBRT for +ve margin (right transverse process) – 24Gy/3#

No systemic therapy given

3 years later no evidence of local prgression

Case 3

- 57M
- Metastatic renal cell carcinoma (lung and scalp)
    - PMH: chronic renal failure
    - Rx: TKI
- 3 years later: Vertebra mets – conventional RT L2-L5; T7-9
- MRI – impending neural compression at L1 ++pain
    - Not possible to operate as would require embolisation first which requires iodinated contrast.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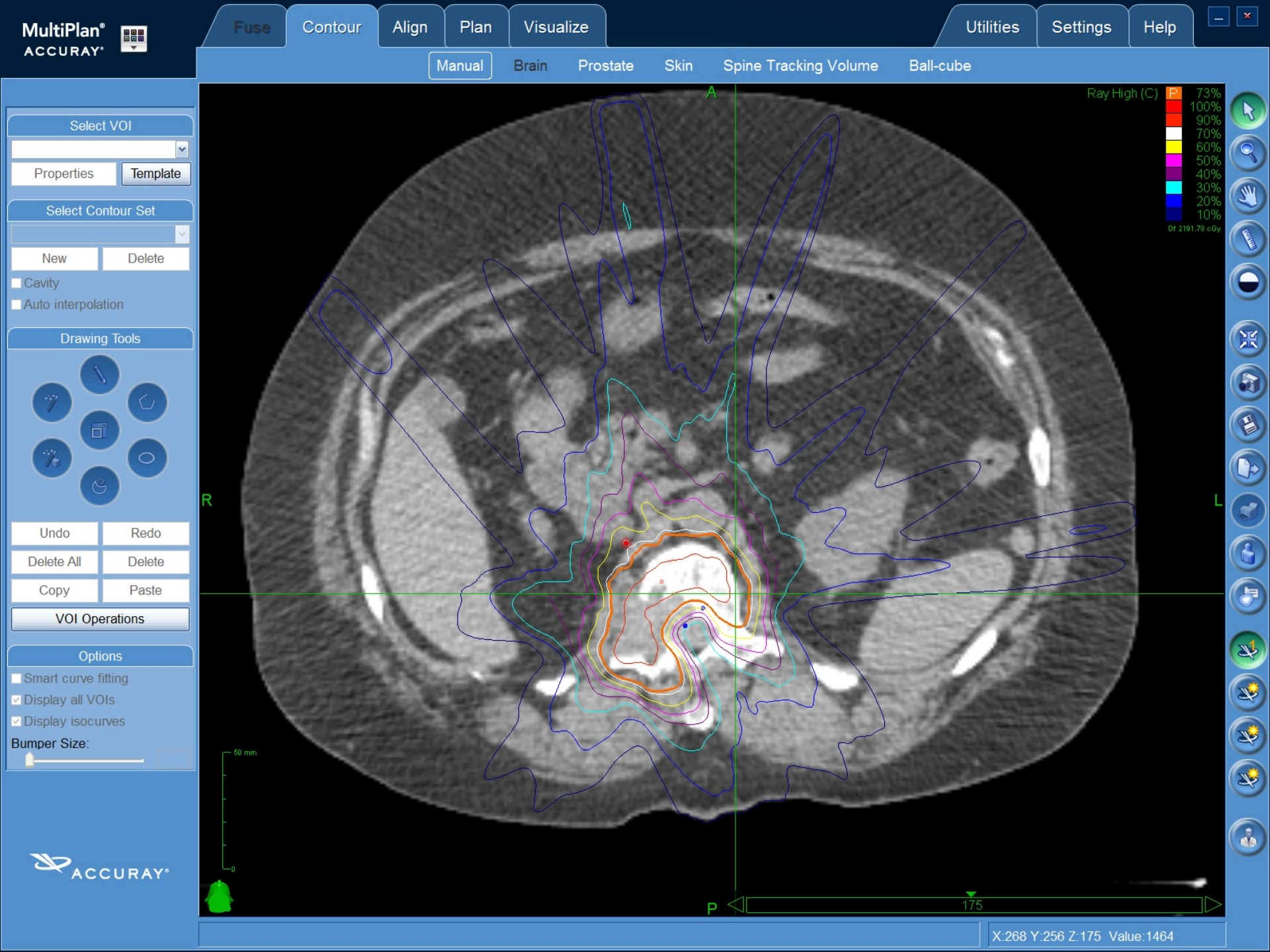
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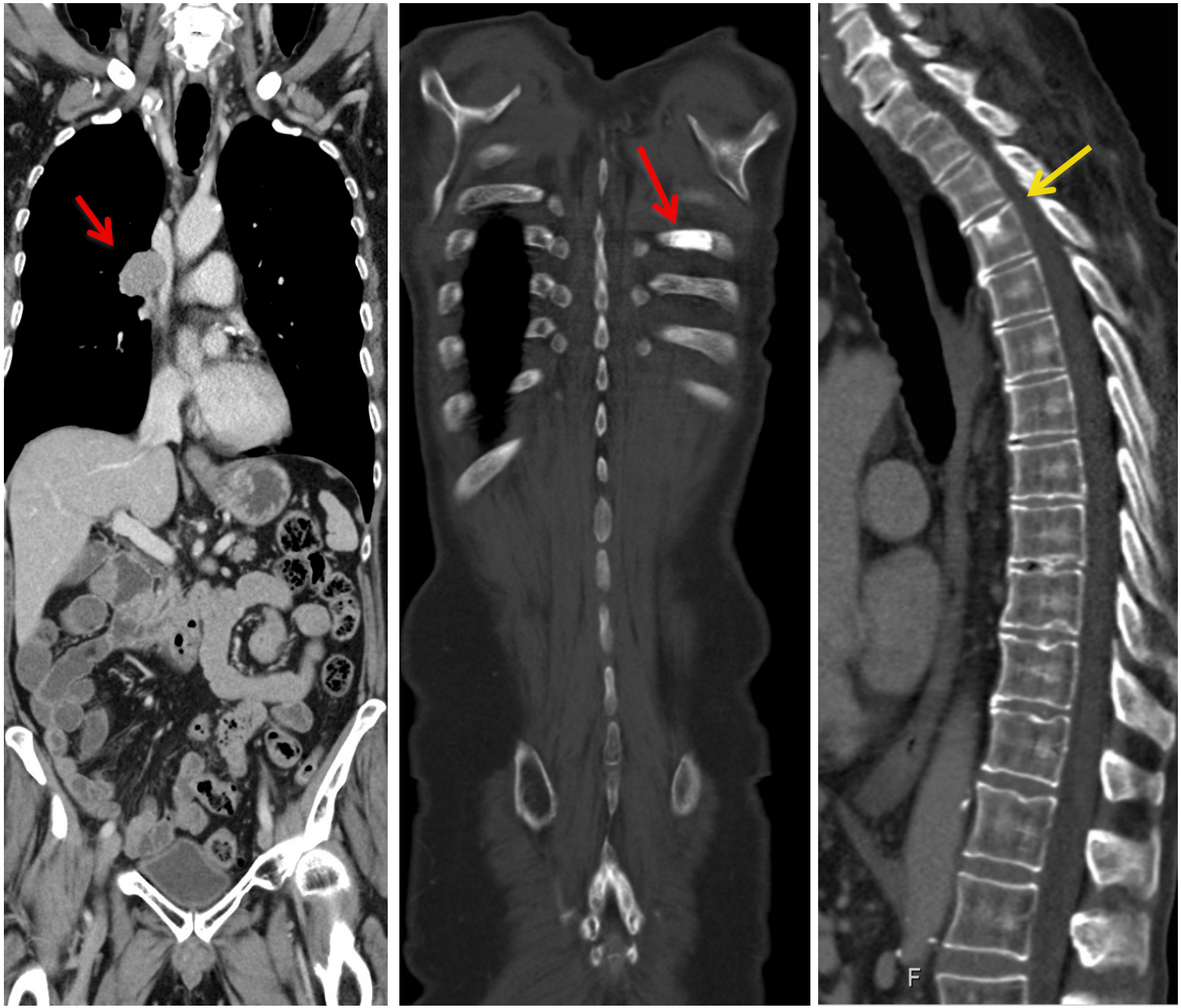
X:268 Y:256 Z:175 Value:1464

Case 3

- Good symptomatic response

Case 4 (Oligo-progression: decisions using modern imaging)

- Metastatic prostate cancer
- On LHRH and Abiraterone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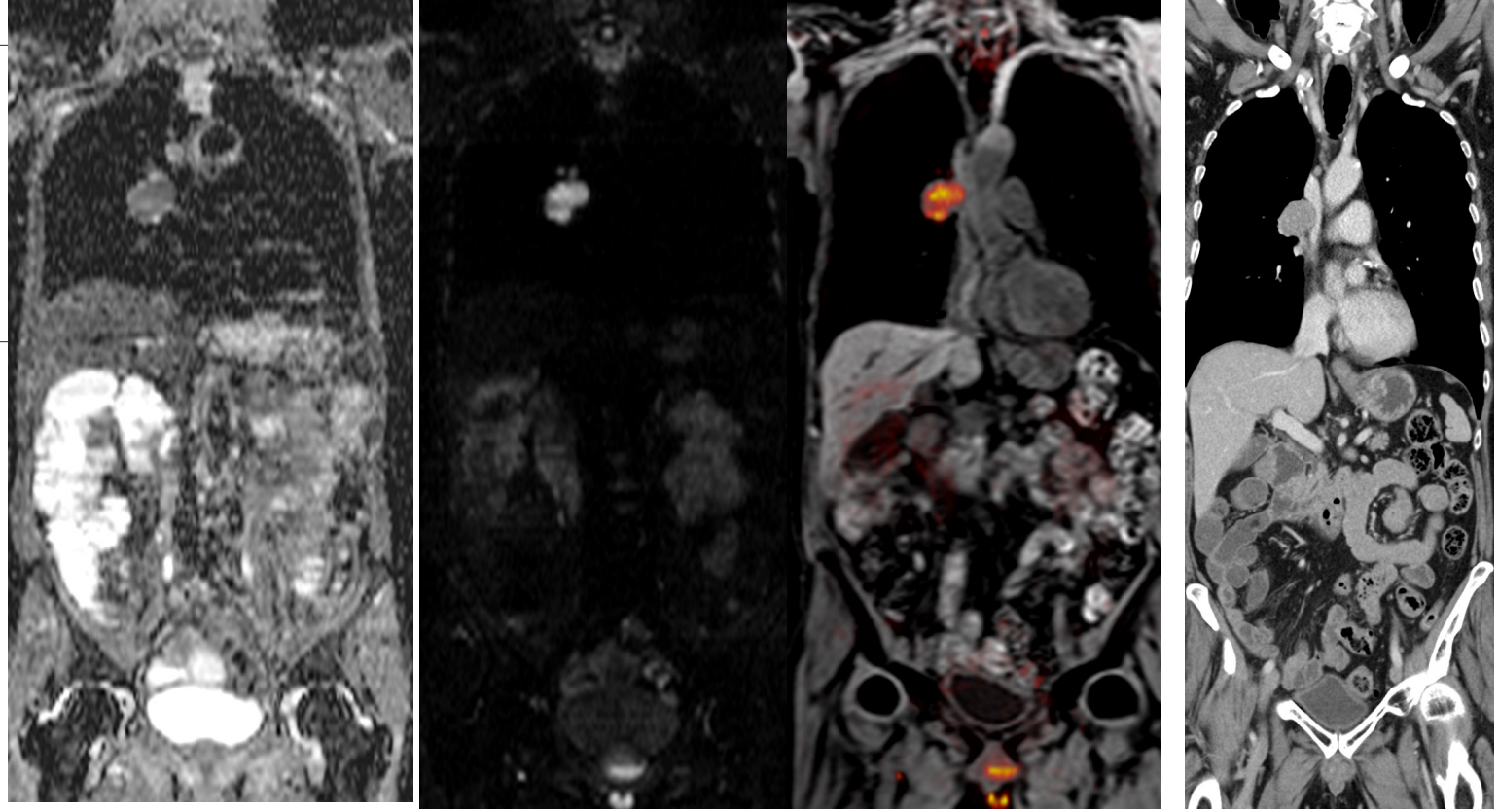
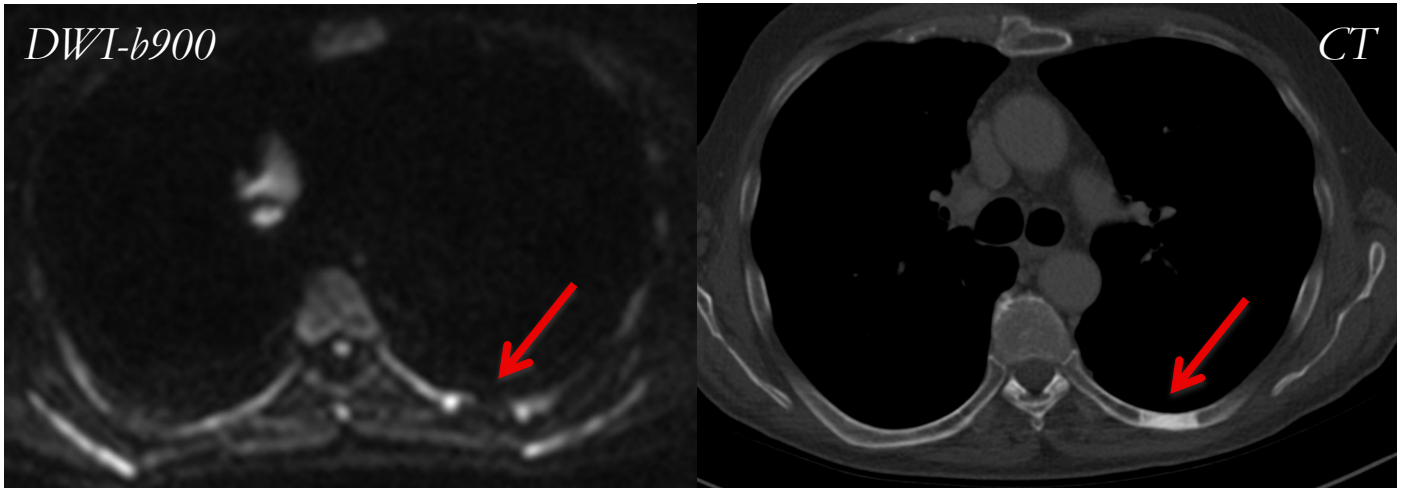
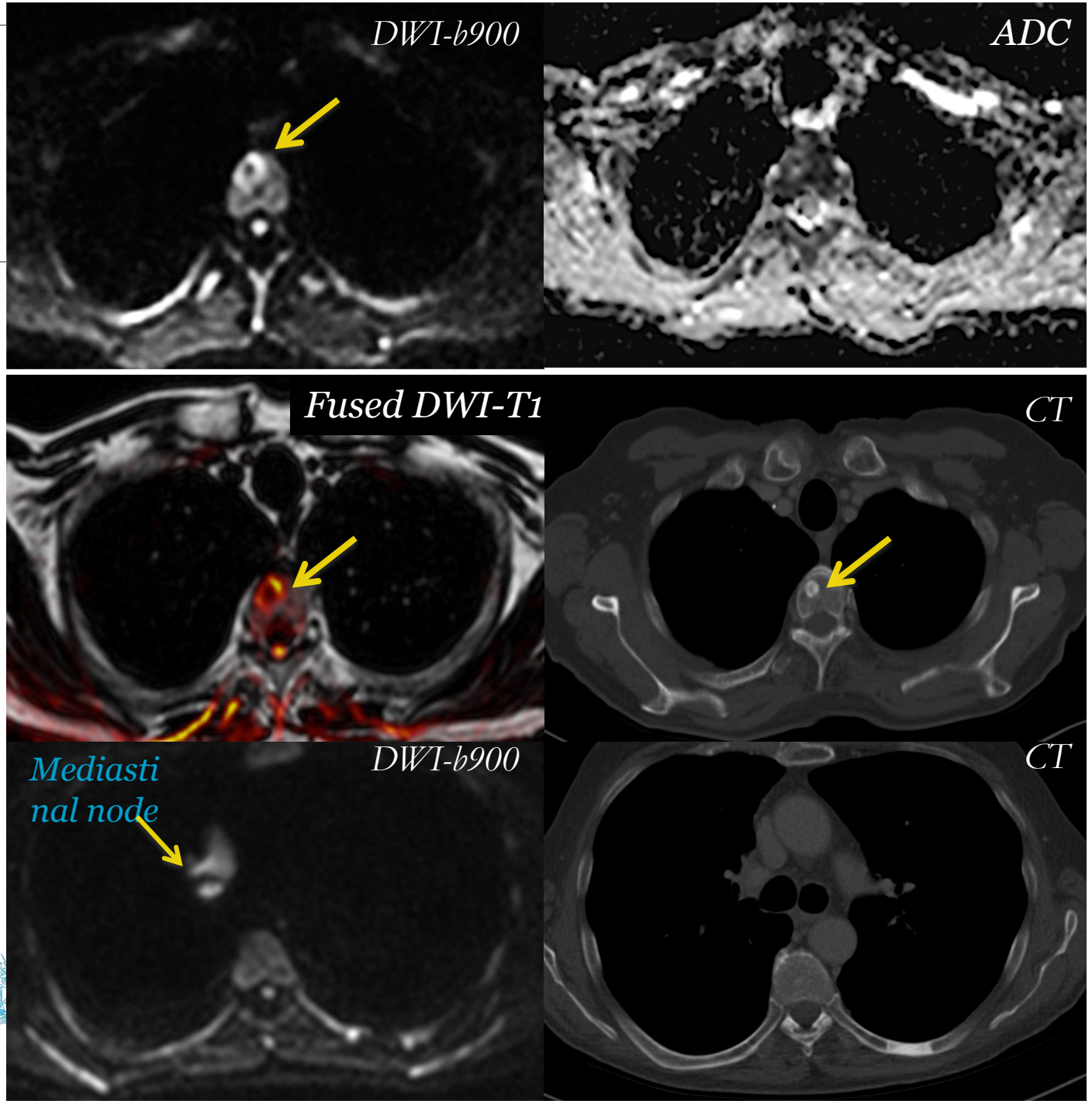


DW MRI

Showing mediastinal nodal disease



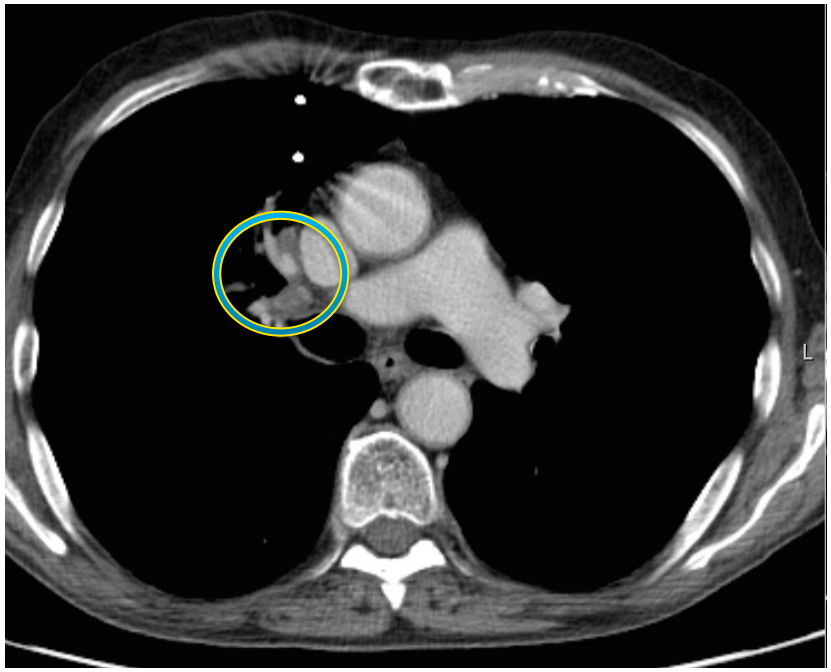


"active sclerotic lesion at T4 (not seen on BS) with evidence of impeded diffusion on DWI

vs

Dense sclerotic lesion on CT (seen on BS) with no signal on DWI thought to represent treated metastasis


L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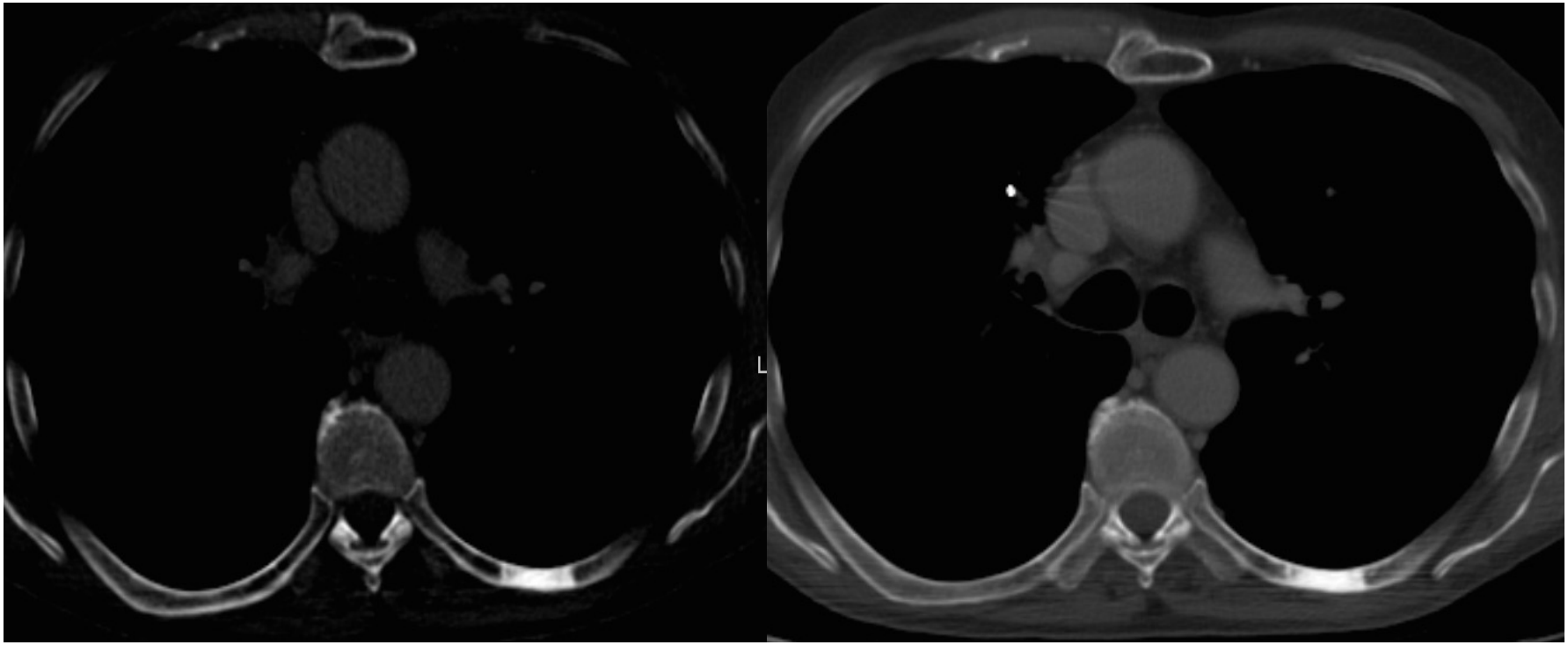

Case 4

He remained on Abiraterone and LHRH for another two years

Then developed widespread bony progression (none of the original sites including the rib progressed)

Conclusion

If you are going to start to spine SBRT

Get trained

Have rigorous planning QA

Discuss all cases at an appropriate skilled MDT, patient selection is critical

Good luck!!

Thank you