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Background

Stage I seminoma has a 15–20% risk of relapse; surveillance without treatment is one option. Relapses principally occur in the para-aortic nodes and the risk can be quantified using factors related to the primary tumour.[1] A tumour >4 cm in size is the most important of these; rete testis involvement may also be a predictor.[2] Adjuvant treatment rather than surveillance may be offered in such cases.

A single dose of carboplatin has been shown to achieve results equal to radiotherapy in terms of overall tumour control and early survival in the TE19 randomised trial.[3] This approach has now become the standard of care (Level 1b).[4]

If radiotherapy is considered in this setting then a dose of 20 Gy in 10 daily fractions treating the para-aortic node chain only has been shown to be as effective as 30 Gy or larger fields (Level 1b).[4,5]

Germ cell neoplasia *in situ* is a premalignant change of testicular tissue with a high rate of progression to invasive cancer. In patients with solitary testis, radiotherapy is recommended as an alternative to surgery where patients have adequate testosterone production to avoid replacement therapy (Level 2b).[4,6,7] This approach may preserve testosterone production but would still cause infertility, though there is a risk of later Leydig cell insufficiency, with studies reporting a testosterone decline of 3.6% per year and a 30–50% risk of requiring testosterone replacement in their lifetime.[8]

Radiotherapy may also be considered for selected patients with stage IIA and IIB seminoma where there are metastatic para-aortic nodes up to 5 cm.[9] A dose of 30 Gy in 15 daily fractions to the para-aortic nodal chain and ipsilateral iliac nodes is recommended. A boost of 5–6 Gy to enlarged lymph nodes may be considered (Level 2b).[4,10,11]

Multimodal treatment strategy is an alternative approach in stages IIA and IIB seminoma, which combines a single dose of carboplatin followed by radiotherapy with a de-escalated field size. One technique is to treat the para-aortic node chain only to 30 Gy in 15 fractions (Level 1b).[4,12] The other technique treats involved node only but stratifies stage IIA to receive 30 Gy in 15 fractions and stage IIB to receive 36 Gy in 18 fractions (Level 1b).[4,13,14]

Radiotherapy carries an excess risk of death as a result of radiation-induced second cancer.[5] Follow-up at 30 years shows that the relative risk of second malignancy is 1.4; this translates into an increase in the risk of cancer from 15% for the normal population to 25% for the seminoma cohort at 30 years (Level 2b).[4,15] These data are mainly from patients receiving para-aortic and pelvic radiotherapy. The risk for patients receiving para-aortic radiotherapy only is predicted to be lower but long-term data are lacking.[16]

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Recommendations

Single-agent carboplatin will be the usual adjuvant treatment for high-risk stage I disease seminoma (Grade B).

Stage I seminoma for which adjuvant para-aortic radiotherapy is indicated:

• 20 Gy in 10 fractions over 2 weeks (Grade A)

Germ cell neoplasia *in situ* in patients with solitary testis:

• 18–20 Gy in 9–10 fractions over 2 weeks (Grade B)

Stage IIA or IIB seminoma: para-aortic and ipsilateral iliac radiotherapy (dog leg) or para-aortic radiotherapy alone after carboplatin:

• 30 Gy in 15 fractions over 3 weeks (Grade B)

Involved-node only radiotherapy after carboplatin:

• Stage IIA seminoma – 30 Gy in 15 fractions over 3 weeks (Grade B)
• Stage IIB seminoma – 36 Gy in 18 fractions over 3.5 weeks (Grade B)

The types of evidence and the grading of recommendations used within this review are based on those proposed by the Oxford Centre for Evidence-Based Medicine.[4]

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Acknowledgements

With thanks to lead authors Prof Robert Huddart (The Royal Marsden NHS Foundation Trust) and Dr JunHao Lim (Nottingham University Hospitals NHS Trust) for reviewing and updating this chapter of the guidance.