Clinical Commissioning Policy Statement Stereotactic Radiosurgery and Stereotactic Radiotherapy for Intracranial Ependymoma (Children)

NHS England Reference: 170090P

Commissioning Position

Summary

Stereotactic Radiosurgery (SRS) or Stereotactic Radiotherapy (SRT) is approved as a treatment option through routine commissioning for children with ependymoma within the criteria set out in this document.

Information about stereotactic radiosurgery and stereotactic radiotherapy

The intervention

The basic principle of SRS and SRT is the treatment of target tissues utilising high intensity and highly conformal radiation. The procedure allows radiation to be limited to the target area and thus helps spare the surrounding tissues as much as possible.

The term SRS is used to mean treatment given as a single dose, and SRT as a hypofractionated treatment of not more than five fractions. This policy statement applies to both of these approaches. Commissioning arrangements for fractionated treatments or larger tumour volumes utilising a larger number of fractions are beyond the remit of this policy.

SRS/SRT is a highly conformal radiotherapy treatment to a precisely delineated target volume, delivered using stereotactic localisation techniques. A multi-disciplinary team (MDT) of neurosurgeons, neuro-oncologists, neuro-radiologists, paediatric clinical oncologists, interventional physicists, radiographers and general anaesthetic teams should be involved in SRS/SRT case selection, treatment planning and delivery.

The condition

Ependymomas are slow-growing tumours of the central nervous system and most commonly present in children. They belong to a group of tumours called gliomas, which start in the glial cells. Ependymomas arise from ependymal cells (a sub-type of glial cells) which line the cerebral ventricles and passageways in the brain and spinal cord. They can be infratentorial tumours (arising in the fourth ventricle, an area of the brain located below the tentorium), supratentorial, or spinal.

Each year, approximately 400 children are diagnosed with a central nervous system (CNS) tumour in the UK, of which 10% (40 cases) are diagnosed with ependymoma.

Based on the information that is available, it has been estimated that less than 10 cases (all ages) per year will be suitable for SRS/SRT treatment.

Current treatments

The first line management options for these patients include: surgical removal followed by adjuvant fractionated radiotherapy; chemotherapy (e.g. Baby Brain regimes in infants) or no intervention (best supportive care). SRS treatment is only considered for highly selected patients as a palliative treatment for relapse when other treatments have failed.

Comparators

There have been no studies with treatment comparators. The first-line treatment of choice in ependymoma is surgical resection followed by adjuvant fractionated radiotherapy where possible.

Clinical trial evidence

One original clinical paper was included in the submission to the Clinical Panel who decided that the policy statement could proceed on the basis of this evidence without a full independent evidence review.

The Clinical Panel recommended that the proposition should be considered for routine commissioning on the basis that there was evidence that the treatment was efficacious on controlling or reducing tumour volume provided the usual treatment options had been exhausted in the face of growing tumour. The Clinical Priorities Advisory Group (CPAG) had previously approved implementation of a clinical policy for rarer tumours for adults on the bases of tumour growth control.

In the adult population which been previously approved for routine commissioning the largest case series (Stauder et al. 2011), with 26 patients with recurrent ependymoma, observed survival rates of 96% and 69% at 1 and 3 years, respectively; progression-free survival rates of 80% and 66% at 1 and 3 years, respectively; and local tumour control rates of 85% and 72% at 1 and 3 years, respectively. The study in the paediatric population below indicated similar rates of survival and progression free survival.

Paper 1. Kano H et al. Stereotactic radiosurgery for pediatric recurrent intracranial ependymomas. J Neurosurg Pediatrics 6**:**041070–400203, 2010

The authors retrospectively reviewed the records of 21 children with ependymomas who underwent SRS for 32 tumours. There were 17 boys and 4 girls with a median age of 6.9 years (range 2.9–17.2 years) in the patient population. All patients underwent resection of an ependymoma followed by cranial or neuraxis (if spinal metastases was confirmed) radiotherapy (RT). Eleven patients had adjuvant chemotherapy. Twelve patients had low-grade ependymomas (17 tumours), and 9 patients had anaplastic ependymomas (15 tumours). The median radiosurgical target volume was 2.2 cm^3 (range 0.1–21.4 cm^3), and the median dose to the tumour margin was 15 Gray (Gy) (range 9–22 Gy). Follow-up imaging demonstrated therapeutic control in 23 (72%) of 32 tumours at a mean follow-up period of 27.6 months (range 6.1–72.8 months). Progression-free survival (PFS) after the initial SRS was 78.4%, 55.5%, and 41.6% at 1, 2, and 3 years, respectively. Factors associated with a longer PFS included patients without spinal metastases ($p = 0.033$) and tumour volumes < 2.2 cm^3 (median tumour volume 2.2 cm^3, $p = 0.029$). An interval ≥ 18 months between RT and SRS was also associated with longer survival ($p = 0.035$). The distant tumour relapse rate despite RT and SRS was 33.6%, 41.0%, and 80.3% at 1, 2, and 3 years, respectively. Overall survival after SRS was 85.2%, 53.2%, and 23.0% at 1, 2, and 3 years, respectively. Adverse radiation effects developed in 2 patients (9.5%).

Adverse events

The limited studies described adverse events related to tumour progression rather than the treatment. SRS in the ependymoma will risk injury to brain and nerves near the tumour location.

Implementation

Criteria

Patients who have recurrent or progressive residual disease in the cranial cavity either at the primary site or elsewhere, following first line treatment (which has included gross total resection, maximal resection), for whom repeat surgical resection is deemed too high-risk or unlikely to succeed and where re-irradiation with conventional radiotherapy as the more standard approach has been explored.

AND

- Re-irradiation with conventional radiotherapy has been explored and felt to be inappropriate
- Tumour is expected to result in morbidity or mortality without treatment

- Absent or stable disseminated metastatic disease
- Volume of tumour suitable for SRS/SRT
- Expected survival is at least 6 months
- At least 6 months must have elapsed since most recent fractionated irradiation at the same site (Photons or Protons)
- At least 6 months must have elapsed since the last SRS/SRT of the target lesion
- At least 3 months must have elapsed since the last SRS/SRT of another distant lesion (and no overlap of previous and current volume)
- Lansky play-performance scale of ≥ 50 or World Health Organisation (WHO) performance status of at least 2

AND

All children are discussed at the paediatric Ependymoma National MDT and treatment is considered appropriate.

Effective from

November 2018.

Recommendations for data collection

The commissioned SRS/SRT services should collect outcome data locally on this treatment modality and provide an annual report on numbers treated and outcomes to the Children's Cancer and Leukaemia Group (CCLG) Radiotherapy group and the Neuro-Oncology Special Interest Group including;

- Overall Survival
- Progression Free Survival
- Neurological deterioration at 0/6/12 months
- Symptomatic imaging changes requiring treatment
- Adverse events

Mechanism for funding

There is an agreed price for the delivery of SRS/SRT. All treatments delivered for this indication will fall within these agreed pricing arrangements.

Policy review date

This is a policy statement, which means that the full process of policy production has been abridged: a full independent evidence review has not been conducted and public consultation has not been undertaken. If a review is needed due to a new evidence base then a new Provisional Policy Proposal needs to be submitted by contacting Clinical Effectiveness Team england.cet@nhs.net.

Links to other Policies

This document updates the existing NHS England policy for rarer CNS tumours for SRS/SRT https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/08/clinical-com-pol-16058p.pdf

Equality Statement

Promoting equality and addressing health inequalities are at the heart of NHS England's values. Throughout the development of the policies and processes cited in this document, we have:

- given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a

relevant protected characteristic (as cited under the Equality Act 2010) and those who do not share it; and

- given regard to the need to reduce inequalities between patients in access to and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities.