
RADIOSURGERY BY X-KNIFE FOR RETROORBITAL METASTASIS FROM FIBROSARCOMA : A CASE REPORT

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ABSTRACT

A case report of retroorbital metastasis fibrosarcoma patient who suffered from painful exophthalmos of left eye was treated with linac based stereotactic radiosurgery (X-knife), a technique that permits the precise delivery of a high dose of radiation from 6 MV linear acclerator to the target while sparing the normal tissue. The radiation dose was 20 Gy at the 75% isodose line encompassing the enhancing tumor. Four weeks after treatment, exophthalmos was almost disappeared and pain symptom was almost completely relieved. The CT scan showed marked regression of the tumor corresponding with clinical appearance, and almost disappeared at 10 weeks. The patient could tolerate well to the treatment procedure without any complications inherent to the technique. Radiosurgery with X-knife is an effective and safe therapy for single palliative treatment of lacialized lesion of head and neck tumor.

INTRODUCTION

Orbital metastasis is not an uncommon metastatic disease.¹⁻² The sites of metastasis are choroid, retrobulbar soft tissue, eyelid or bony orbit.³⁻⁶ Clinical symptoms and signs of ocular metastasis are exophthalmos, pain, ophthalmoplegia and diplopia, palpable mass, proptosis, periorbital swelling, and pseudo-inflammation.^{2-3,5} Local treatment by radiotherapy for palliative treatment in single orbital metastasis could provide the fair result. The complete response were 25-50%, while the overall response rate was as high as 85%.⁷⁻¹² In cases of palliative treatment, simple technique of the short overall treatment period without adding complications should be used to have the best quality for the rest of

one's life. The convenience and efficacy of radiosurgery procedure leading to an increasing use of this treatment for brain metastasis, and also in palliative treatment in other sites of tumor such as base of skull, head and neck region.¹³⁻¹⁹

This report describes the palliative radiation for orbital metastasis from fibrosarcoma by the linac based radiosurgery in term of accuracy and efficacy of the linear accelerator facility or X-knife.

CASE REPORT

A 56 years old female patient, known case of fibrosarcoma of left humerus post resection 4 years ago, developed bone and lung metastases 3 years later. She was treated with radiation for palliative

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bone pain but she refused systemic chemotherapy. Two months before attending our department, she suffered from the painful exophthalmos of left eye with diplopia and periorbital swelling. She refused conventional radiation therapy because of the long period of treatment. So the stereotactic radiosurgery technique with X-knife was offered.

RADIOSURGICAL TECHNIQUE

The technique was the same as we treated the intracranial lesion. The BRW stereotactic headframe was transversely fixed to the patient's head with local anaesthesia by neurosurgeon. The stereotactic images were done by computerized tomographic scan to get the spatial coordinates of the lesion. After stereotactic CT images were done, the data was transferred to the computerized planning system for X-knife treatment planning program. The external surface, the tumor and critical structures such as eyes, optic nerve, optic chiasma and brain stem were labeled in the CT images and reconstructed to be the three dimensional structures. The treatment planning was started by defining the isocenter with suitable collimator in the tumor and the multiple non-coplanar

radiation beams were planned. The dose was prescribed at 75% isodose line to be 20 Gy which encompassed the area of enhancement. Before completion of the treatment planning, we have to ensure that the radiation field conforms precisely to the surgical target. Dose distribution is facilitated by 3-D visualization, dose volume histograms of the primary tumor and surrounding critical structures, especially optic nerve in this case. Radiation treatment set up proceeded by 2 radiation technologists under the supervision of the radiation oncologist.

RESULT

The radiosurgical procedure with X-knife was well succeeded without immediate complications. Four weeks later, the patient showed a very good response with improvement of exophthalmos and proptosis. Pain was almost completely relieved but diplopia was still exist. The CT scan showed marked decrease of tumor size as compared to the previous film. (Fig 2) There was no any skin reaction. Mild conjunctivitis occurred but subsided later without specific treatment. The quality of life was much improved.



Fig.1 CT scan revealed ill defined mass at the superiolateral aspect of the left orbit forming an extraconal mass with exophthalmos and destruction of the surrounding bone.

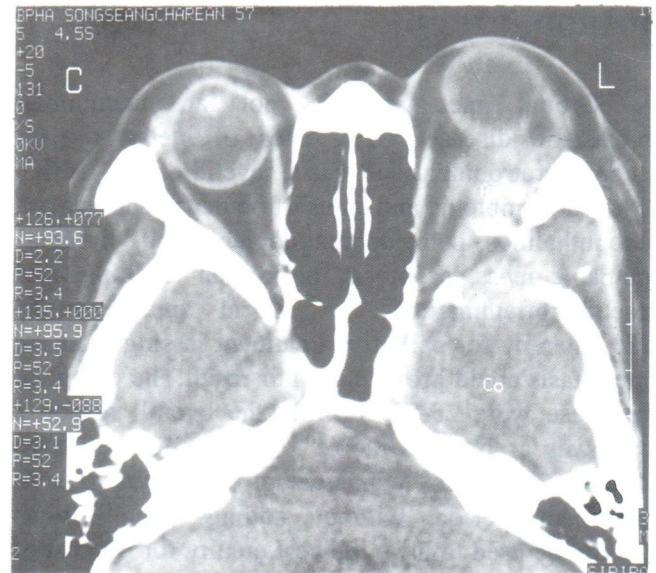


Fig 2. CT scan at 1 month after treatment shows decreasing in size of the tumor and the recovery of exophthalmos.

The tumor showed further shrinkage at the 10 weeks follow up.(fig.3)

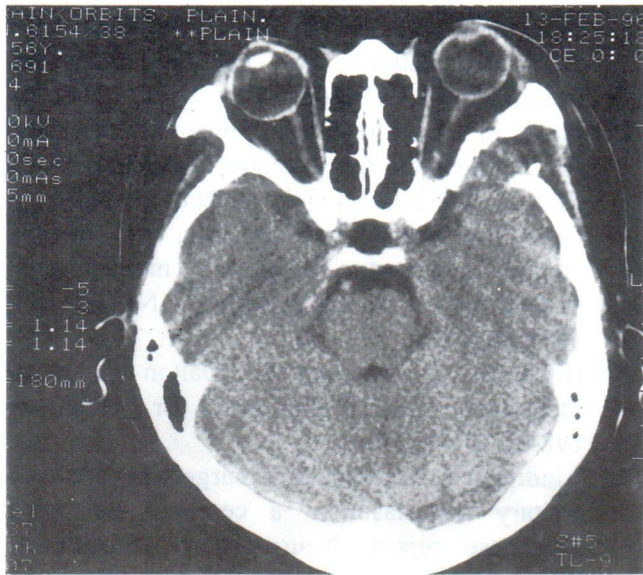


Fig 3. CT scan at 10 weeks showed the tumor almostly disappeared.

DISCUSSION

The most common metastatic site of fibrosarcoma is the lung. Orbital metastasis is a rare condition.²⁰⁻²² Surgery is the mainstay of therapy and radiation usually be the adjuvant or palliative treatment. In this case, the patient refused to be treated for the metastatic sites in the lungs but she asked for the treatment of pain in the orbital metastasis. Excellent result have been achieved eventhough it was a fibrosarcoma that was recognised as a radioresistant tumor. This result is the same as the good result of the focusing high radiation dose treated for the traditional radioresistant tumor like malignant melanoma^{13-15, 23-27}

From the clinical symptom and follow up CT scan showed a very promising result, the exophthalmos almost disappeared without any complications, no skin reaction that normally appeared in conventional radiotherapy. The other distinct advantage is the short treatment period of only 1-2 days compared to one and a half month by conventional radiation.

CONCLUSION

Linac based radiosurgery or X-knife is a safe, effective and appropriate procedure for palliative treatment that provides good palliation of the symptoms with less complications and short treatment period. This technique can also be used in curative intent as a primary treatment, as booster in big tumor or in cases of having received previous radiation.

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