

Bleomycin toxicity post injection into craniopharyngioma

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Abstract

Craniopharyngioma is a common suprasellar mass that is frequently encountered in radiology. These tumours are difficult to treat, with a combination of resection and radiation therapy having been the gold standard. Our case highlights a complication of a newer approach to treatment in which bleomycin is administered into the tumour via a catheter, usually an Ommaya reservoir that is surgically placed.

Presentation

A 41-year-old woman was diagnosed with craniopharyngioma in 2002. Three separate surgical resections were performed in the course of 2002 and 2003. The patient subsequently developed panhypopituitarism, diabetes insipidus and total blindness. Following radiation therapy, she regained vision in her right eye. She also developed hydrocephalus post radiotherapy, for which a VP shunt was placed. An Ommaya reservoir was also placed.

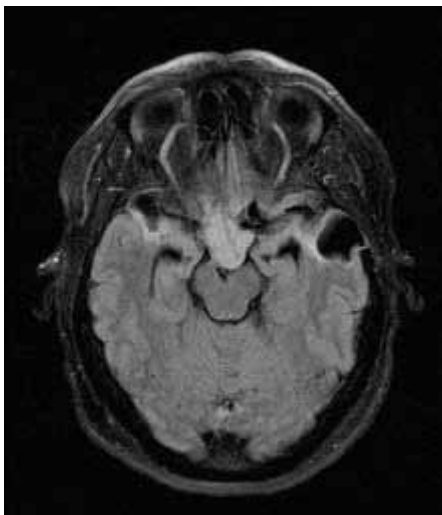


Fig. 1. Axial FLAIR image through the level of the midbrain pre bleomycin administration.

In July 2010, she was started on intra-tumoural bleomycin injections. A total of only 5 doses were administered. Doses of 5 mg bleomycin were administered 3 times a week on an outpatient basis. After the second dose, the patient developed transient headaches, and the third

dose was omitted. Three further doses were administered as scheduled. After the fifth dose, she presented with worsening confusion, headache and agitation, and was admitted to hospital for further care; no further bleomycin was injected.

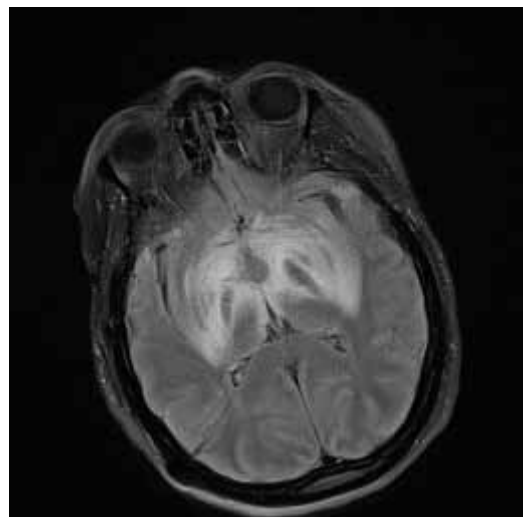


Fig. 2. Axial FLAIR image through the level of the midbrain 3 weeks post bleomycin administration, which shows significant peri-tumoural vasogenic oedema.

Magnetic resonance imaging (MRI) was performed 12 days after the final injection. This showed extensive vasogenic oedema in the basal ganglia and midbrain surrounding the tumour. A diagnosis of bleomycin toxicity post intra-tumoural injection into her craniopharyngioma was subsequently made on the basis of the imaging findings and exclusion of other aetiologies. The oedema progressed on a subsequent MRI performed a week later.

On 4-month follow-up, the patient's condition had improved, and repeat MRI revealed a significant decrease in the amount of oedema.

Discussion

Craniopharyngiomas are suprasellar tumours that are believed to arise from craniopharyngeal duct remnants.¹ These tumours are common and represent 50% of all suprasellar tumours in childhood, with a peak incidence between the ages of 8 and 12 years and a second, smaller, peak in middle-aged adults.² The tumours are typically lobulated, cystic masses with a mural nodule.² The cystic component is often the

predominant portion and occurs in over 90% of cases.³ The fluid content of the tumour is usually thick and yellow, and can be reminiscent of engine oil on gross pathology.²

Typical features on computed tomography (CT) include a cystic component with attenuation slightly higher than CSF, and calcification, which may be thin and peripheral or coarse within the solid portion.² Calcification is seen in about 50% of adult patients and in as much as 90% of paediatric patients.¹ Contrast enhancement of the cyst walls and other solid components is present in more than 90% of cases.²

The MR appearance of the cystic component is varied, but commonly the content is hypo-intense on T1 and hyperintense on T2. The solid components usually enhance heterogeneously.²

Symptoms relate to mass effect on suprasellar structures, as well as local invasion,³ and often include headache, endocrine deficiencies and visual disturbances.⁴

Although these tumours show benign histology, their location, as well as their intimate relationship with delicate sellar structures, complicates management. Management generally consists of either aggressive surgery or a combination of limited surgical resection and radiation therapy.⁵ Newer treatment options now include placement of an Ommaya catheter into the cystic portion with instillation of bleomycin into the tumour. Less commonly, other sclerosing agents or isotopes have also been used. The Ommaya catheter is usually placed and tested postoperatively by means of instillation of X-ray contrast, followed by non-enhanced CT to assess for leakage.³



Fig. 3. Axial CT image shows an Ommaya catheter in place with contrast instilled into the tumoural cavity to check for any leakage of contrast pre bleomycin instillation.

In the case of bleomycin, there is variability in the schedule of administration, but a dose of 3 mg is typically given 3 times weekly for 5 weeks, followed by once weekly for 10 weeks.⁵ Doses can be temporarily discontinued or stopped if the patient becomes symptomatic, as in our case.

Acute side-effects include transient mild fever, nausea, vomiting and headaches. These occur in up to 70% of patients within the first 24 hours after each administration, and are usually self-limiting.³ More severe delayed side-effects are highly varied, but much more rare, and occurred in only 2 out of 17 cases in a Canadian series.⁴ Intravenous corticosteroid administration is often used for treatment of peritumoural oedema and seems effective, although it is not well researched as to whether supportive therapy alone would have a much different outcome.⁵

MRI – in particular, FLAIR – is the modality of choice for diagnosing bleomycin toxicity.⁵ Findings usually consist of varying degrees of peritumoural vasogenic oedema in the midbrain and basal ganglia,⁶ which is thought to be the result of local bleomycin effect in combination with a small amount of peri-tumoural leakage, and are predominantly reversible.⁵

This treatment option is used in combination with traditional modalities, and can be of significant value if surgery can be deferred as long as possible, because the intra-tumoural instillation of bleomycin has a decreased morbidity for the patient compared with surgery.⁴

Conclusion

Intralesional bleomycin injection is becoming an increasingly more popular treatment option for cystic craniopharyngioma. Although this procedure is less invasive compared to open resection and is relatively safe, there are still significant risks involved with this form of treatment. It is of the utmost importance that radiologists are aware of possible complications and are able to identify them early to ensure prompt management.

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