CASE REPORT

To stop or not? Tamoxifen therapy for secondary prevention of breast cancer in a patient with ocular toxicity

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SUMMARY

We report a case of a patient with treated breast cancer whose dilated fundus examination showed crystalline deposits in the central region of the macula. She was taking tamoxifen for secondary prevention. Optical coherence tomography revealed individual refractile deposits associated with intraretinal cysts in both eyes. Tamoxifen-related retinopathy was suspected. A decision to discontinue treatment with tamoxifen was considered but had to be taken in conjunction with the oncologist.

BACKGROUND

Crystalline retinal deposits are known to occur in a number of systemic conditions, as well as in association with ingestion of certain drugs. Tamoxifen is a non-steroidal antioestrogen agent that is widely used to reduce the risk of developing recurrent breast cancer in high-risk patients.^{1 2} Tamoxifen-related crystalline retinopathy is a well-recognised entity.³ We describe a patient with features of tamoxifen-related retinopathy in whom the decision to discontinue treatment had to be considered and balanced with risk of recurrent disease.

CASE PRESENTATION

A 52-year-old woman was referred to our ophthalmology department in 2014 after a review by her optometrist. Her best corrected visual acuity was 6/9 in both eyes. In 2008, she had been diagnosed with right-sided breast cancer. She underwent a wide local excision, postoperative radiotherapy to the affected breast and chemotherapy. Her tumour was a 21 mm, grade 2, invasive lobular carcinoma with extensive surrounding lobular carcinoma in situ. The tumour was oestrogen receptor (ER) positive and human epidermal growth factor receptor 2 (HER2) negative. Sentinel node biopsy was negative.

At the time of presentation, the patient was taking 20 mg of tamoxifen daily. This was ongoing for 5 years. A dilated examination of her fundi revealed fine, cream-coloured, refractile deposits around the fovea in both eyes (figure 1A). High-resolution, spatial domain optical coherence tomography (SD-OCT) imaging was undertaken. Intraretinal cysts and refractile deposits were seen in both maculae (figure 1B). The refractile deposits on OCT were presumed to be tamoxifen crystals whereas the cystic changes were deemed a consequence of structural damage to the inner retina. There were no other abnormalities noted on

ophthalmic examination other than the retinal changes described. The patient was subjectively asymptomatic.

In view of the likelihood of progressive retinopathy, it was felt that a decision either to stop or continue treatment with tamoxifen would have to involve her oncologist and be balanced with the risk of tumour recurrence. An opinion was therefore sought and further review planned.

OUTCOME AND FOLLOW-UP

For the patient described in this case, treatment was discontinued with the patient's informed consent, by her oncologist, on the grounds of a significant disease-free period. After 6 months, there was no significant change in the retina of both eyes and vision was stable.

DISCUSSION

Ocular toxicity secondary to high-dose (240–320 mg/day) tamoxifen was first described in 1978 by Kaiser-Kupfer and Lippman.⁴ It was later found that even smaller doses (20–40 mg/day) of tamoxifen can cause ocular side effects, although the changes may be less extensive.^{5 6} Tamoxifen ocular toxicity can result in reduced vision through keratopathy, cataract, crystalline retinal deposits

Figure 1 (A) Colour fundus photograph of right eye showing multiple, small, yellow, refractile deposits on the macula, (B) optical coherence tomography of the right eye showing intraretinal cysts and deposits in the inner retina.

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associated with macular oedema and optic neuritis.^{4–8} The incidence of tamoxifen-related ocular toxicity among patients taking low-dose tamoxifen (20 mg/day) has been reported as ranging from 6.3%⁶ to 12%⁸ in two prospective studies.

Total cumulative dose of tamoxifen and duration of treatment are believed to be the main factors associated with increased incidence of ocular toxicity.⁸ However, there is much variation in the literature regarding 'safe' cumulative doses and 'maximum' duration of treatment.^{5–9} It has been suggested that screening for tamoxifen-related ocular toxicity is not required in patients who are on a low dose or who have been on treatment for a short duration of time.^{9–10} A total cumulative dose of less than 23.7 g has been reported as being safe by one study.⁹ Our patient had received a significant cumulative dose of tamoxifen—amounting to 40 g over a period of 5.5 years.

Discontinuation of tamoxifen may not cause regression of retinal deposits.^{5–6} However, other changes, such as keratopathy

and macular oedema, have been reported as being reversible.^{5–6–8}

Clinicians should be aware of tamoxifen-related ocular toxicity and should perhaps discuss the risk when starting treatment. Patients should also be advised to seek prompt ophthalmic review if there are any ocular or visual concerns. A multidisciplinary approach is needed to appropriately manage affected patients.

Contributors TB collected data and drafted the article. ZIC identified and managed the case and revised the paper. He is the guarantor.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- ▶ Ocular toxicity secondary to tamoxifen can present with reduced vision through keratopathy, cataract, crystalline retinal deposits associated with macular oedema and optic neuritis.
- ▶ Even small dose (20–40 mg/day) tamoxifen can cause ocular side effects.
- ▶ The incidence of ocular toxicity rises with increasing total cumulative dose of tamoxifen and duration of treatment.
- ▶ Patients should be warned about the risks of tamoxifen-related ocular toxicity on initiation.
- ▶ Patients on tamoxifen should be promptly referred to the ophthalmological team should there be any ocular symptoms.

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