

**Figure 2** NF-1 with choroidal ganglioneuroma: histopathology of the choroidal mass showing a cellular lesion consisting of bundles of spindle cells admixed with clusters of ganglion cells (haematoxylin and eosin,  $\times 500$ ) (left), immunohistochemistry showing neuron-specific enolase staining of the ganglion cells (centre), and immunohistochemistry showing neural filament protein within the cytoplasm of the spindle cells (right).

blind eye revealed an unsuspected choroidal ganglioneuroma.

Ganglioneuromas are most commonly located in the posterior mediastinum (42%) and retroperitoneum (38%).<sup>4</sup> Reports exist of ganglioneuromas in various organ systems of the body in association with NF-1, with an associative relation being hypothesized.<sup>1</sup>

We report a patient with NF-1 who underwent enucleation with HPE demonstrating a hitherto unsuspected choroidal ganglioneuroma. Reports of local recurrences with malignant transformation are of concern, entailing close follow-up.<sup>1</sup>

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## Sir, Intraoperative breakage of the mushroom manipulator tip during phacoemulsification

We report three cases of breakage of a mushroom manipulator tip at the end of phacoemulsification. The technique used was divide and conquer in all three cases.

## Case reports

### Case 1

At the end of the fourth segment removal, the mushroom manipulator tip was missing. Aspiration of soft lens matter was carried out, a posterior chamber lens was implanted, and the tip was detected floating inside the capsular bag beneath the implant. The capsular bag was filled with heavy ophthalmic viscoelastic device (OVD), the implant was tilted using a lens dialler, and the tip retrieved with vitreous forceps.

### Case 2

All nuclear segments had been removed, the manipulator was being taken out of the eye when its head came off the stem remaining embedded at the inner aspect of the side port. Retrieval of the tip was carried out using OVD to dislodge the fragment from the side port towards the main wound, whereas the suction of a lacrimal cannula was used to remove the fragment through the main port.

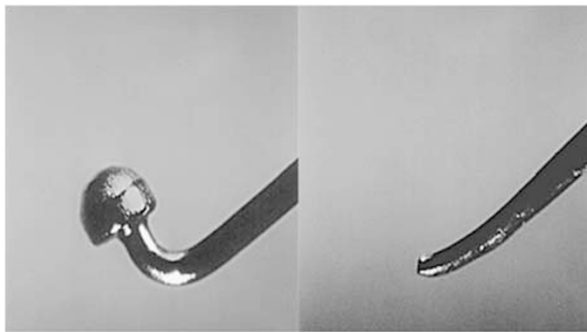
### Case 3

Two segments out of four had been removed when the broken mushroom head was noticed floating in the capsular bag. The fragment was lifted up to the iris plane using OVD and was then dragged by gentle aspiration with a lacrimal cannula towards the main port and out of the eye. The remaining segments were successfully retrieved without complications, there was no evidence of metallic particles seen postoperatively on biomicroscopy, and the cornea was clear. Specular microscopy was not available in the department and could not be performed.

Two of the broken mushrooms and further eight unbroken instruments were sent to the manufacturer for investigations. Their microscopic examination revealed significant wear around the stem, decreased thickness, and numerous surface marks compared with an undamaged instrument (Figure 1). An *in vitro* attempt to replicate this damage to the manipulator resulted in complete separation of the head after 15 s of continuous phacoemulsification (0.20 min at 60% power) with the Alcon Legacy 20 000 machine.

### Comment

The three reported incidents occurred in our unit to two different surgeons over a period of 3 months. This occurrence could be totally coincidental; on the other



**Figure 1** An undamaged mushroom manipulator (left) and a broken one with numerous surface marks (right).

hand, the manipulators had all been bought at the same time, and this may suggest that they were all reaching a mechanical end point over the same period of time and amount of use.<sup>1,2</sup>

The vibration of the phacoemulsification handpiece is known to cause metallic particles to chip off surgical instruments, with progressive weakening.<sup>3,4</sup> Based on the manufacturer's findings (personal communication) and our *in vitro* experience, the most likely explanation is repeated inadvertent contact between the manipulator and the phacoemulsification needle during surgery, causing progressive weakening and eventual breakage of the tip from minimal stress. To the best of our knowledge, this is the first series of intraoperative macroscopic breakage of the same type of nucleus manipulator without ocular damage. Since the occurrence of this unusual complication, we no longer use the mushroom manipulator and would recommend care to avoid inadvertent contact between instruments within the anterior chamber during phacoemulsification.

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