

Retained silicone tip of diamond-dusted membrane scraper during vitrectomy in a valved cannula system

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Abstract

Purpose To report a complication of retained silicone tip from a diamond-dusted membrane scraper (DDMS) that occurred while using a valved cannula vitrectomy system.

Method Retrospective review of three cases that underwent 23 gauge (G) sutureless vitrectomy for idiopathic macular hole (cases 1 and 2) and myopic macular schisis (case 3).

Results In all three cases following a standard vitrectomy, the internal limiting membrane (ILM) peeling was initiated by using a 23G DDMS. During the insertion of the DDMS, the flexible silicone tip of the 23G DDMS was detached from the metal shaft and was retained in the 23G valve system and in case 3, the silicone tip got dislodged from the valve onto the retina. Subsequent ILM peeling was completed by using an end-gripping forceps. All underwent intravitreal gas injection at the end. No other complications were noted.

Conclusion These three cases demonstrate an uncommon complication of retained silicone tip within the valved cannula vitrectomy system and this complication should be considered while using flexible instruments in valved cannula systems.

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Introduction

Internal limiting membrane (ILM) peeling is an integral step in surgically managing idiopathic macular hole (MH).¹ ILM peel can be initiated by using multiple methods and one such method involves the use of a Tano's diamond-dusted membrane scraper (DDMS). DDMS has

three parts; a flexible diamond-dusted silicone tip attached to a metallic shaft that connects to a plastic handle.^{2,3}

Valved cannula system usage in vitrectomy provides a closed system, averting intra-operative hypotony and the need for usage of plugs. However, the valved cannula systems are not totally devoid of concerns.⁴ We report three cases where the tip of the 23 gauge (G) DDMS (Synergetics, O'Fallon, MO, USA) was retained while using the Alcon 23G valved entry system (Alcon, Fort Worth, TX, USA).

Case reports

Case 1

A 66-year-old male was reported to Bristol Eye Hospital with reduced vision in the left eye. On examination, left visual acuity (VA) was 6/48. Fundus examination suggested idiopathic MH. Spectral domain optical coherence tomography (SD OCT) confirmed stage 3 MH. The patient was considered for vitrectomy. The surgical concerns are described below in surgical details paragraph. The post-operative VA settled at 6/18.

Case 2

A 69-year-old male with presenting VA 6/24 left eye was diagnosed with idiopathic MH at Bristol Eye Hospital. The SD OCT confirmed stage 4 MH. The patient underwent vitrectomy. Surgical details are discussed below. Post-operative VA was 6/12.

Case 3

A 79-year-old female previously diagnosed with high myopia and left amblyopia was reported to

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Birmingham and Midland Eye Center with reduced vision in the left eye. VA in the presenting eye was hand movements and funduscopy showed shallow posterior pole elevation without any obvious retinal breaks. SD OCT was suggestive of myopic macular schisis. She was considered for surgery, details are discussed below.

Surgical details

All three cases were considered for vitrectomy, ILM peeling and intravitreal gas injection. In first two cases, the flexible silicone tip of the DDMS attached to the metallic handle encountered resistance while introducing through the valved entry system into the eye. Owing to

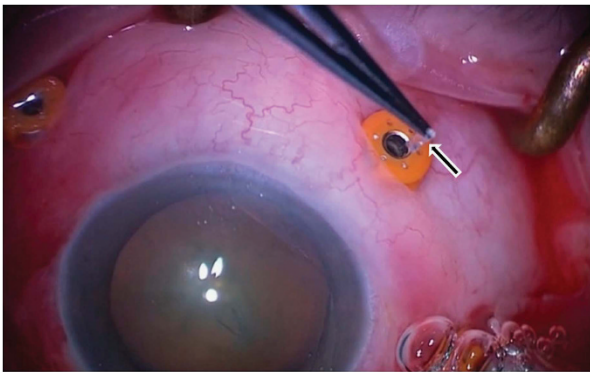


Figure 1 Retrieval of retained silicone tip through the entry port. The external photograph of the right eye shows the retained silicone tip grasped using the forceps from the entry port (the arrow points towards the silicone tip of Tano's DDMS).



Figure 2 Broken flexible silicone tip lying on the retina. The still retinal photograph obtained from a video recording shows the broken silicone tip of the Tano's DDMS lying on the retina (the arrow points towards the dislodged tip). This is from case 3.

the unusual resistance encountered, the DDMS was withdrawn from the entry system and the silicone tip of the DDMS was noted to have come off from the DDMS metal shaft (Figure 1). In both these cases, the valved entry port through which the DDMS had been introduced was removed from the eye. The flexible tip was noted to be caught in the shaft of the 23G entry system, lying just beyond the valve. The valved entry system was replaced with a new port and a new DDMS was used to complete the initiation of ILM peeling.

In the third case, the initial resistance was similarly felt; however, the DDMS was advanced through the 23G valved entry system and the ILM peel was initiated. On withdrawing, the flexible tip of the DDMS was noted to have come off from the shaft. The cutter was then introduced through the valved port and the diamond-dusted silicone tip was found on the surface of the retina, which was then retrieved atraumatically by using the suction of vitreous cutter. We believe the silicone tip may have come off the metal shaft while withdrawing the DDMS through the valve and got caught within the valve. Subsequently, when the cutter was introduced through the same port it may have dislodged the tip, which was lying beyond the valve, onto the retinal surface (Figure 2).

In all three cases, ILM peeling was subsequently completed with no further complications. Clinical examination and SD OCT following resolution of the gas bubble demonstrated closure of the MH in cases 1 and 2 and flattening of the fovea in case 3.

Table 1 summarises the demographics, pre-operative, operative and post-operative features of the three cases studied.

Discussion

To the best of our knowledge, detachment of the flexible tip of DDMS when used with a valved cannula system has not been reported in the literature. There are two manufacturer and user facility device experience (MAUDE) adverse event reports regarding damage to the tip of the DDMS intra-operatively; however, details of these incidents are limited (www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfMAUDE/detail.cfm?mdrfoi_id=1379773) (www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfMAUDE/detail.cfm?mdrfoi_id=778830).

In all our cases, resistance was encountered while introducing the DDMS. This initial resistance should raise suspicion and surgeons should be aware of this potential complication, especially while using the DDMS in a valved system. DDMS should be introduced, withdrawn and reintroduced ensuring that the tip is not bending through the valve. We advise rechecking

Table 1 Table summarises the demographics, pre-operative, operative and post-operative features of the three cases studied

	Age/ gender	Diagnosis	Operative procedure performed	Intra-operative concern	Post-operative period
Case 1	66 years/ male	Stage 3 MH left eye	Standard vitrectomy, ILM peeling and gas tamponade	Resistance felt during passage of the DDMS through the valved port; flexible silicone tip of DDMS was caught at the entry port	MH Closed
Case 2	69 years/ male	Stage 4 MH left eye	Standard vitrectomy, ILM peeling and gas tamponade	Resistance felt during passage of the DDMS through the valved port; flexible silicone tip of DDMS was caught to the entry port	MH Closed
Case 3	79 years/ Female	Myopic foveal schisis left eye	Standard vitrectomy, ILM peeling and gas tamponade	Similar initial resistance noted while passing the DDMS through the valved port; however, the DDMS was advanced further and later, the flexible silicone tip was found on the retina. (see case description)	Fovea flat

Abbreviations: DDMS, Tano's diamond-dusted membrane scraper; ILM, internal limiting membrane; MH, macular hole.

under microscope the integrity of the silicone tip every time the DDMS is withdrawn from the eye and using retractable DDMS in a valved cannula system where possible.

Summary

What was known before

- Flexible instruments may be a challenge in valved cannula systems, but to the best of our knowledge complication has not been reported in literature.

What this study adds

- Flexible instruments can sometimes be difficult in manoeuvring in a valved cannula system as they can get caught in the valve because of the flexibility and complications depicted in our series can occur. Surgeons need to be aware of this to avoid potential complication.

Conflict of interest

The authors declare no conflict of interest.

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