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Title: Endoscopic Marsupialization and Drainage of a Septated Sphenoid Sinus Mucocele in a Revision Skull Base Setting

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

✓ Correct

2. Interview statements: Which interview statement filming option is the most appropriate for your group? **Please select one.**



Interview Statements are read by JoVE's voiceover talent.

3. Proposed interview filming date: Please indicate the proposed date that your group will self-film interviews: **MM/DD/YYYY**

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Current Protocol Length

Number of Steps: 15

Number of Shots: 18

Interviews

NOTE to VO: Please record the interview and conclusion statements

INTRODUCTION:

REQUIRED: Briefly describe the clinical case presented in this video and the treatment approach used.

- 1.1. This case presents a septated sphenoid mucocoele following prior sphenoid surgery, managed with endoscopic marsupialization and drainage.

- 1.1.1. 2.10.1

~~Describe any unique or rare clinical features observed in this case.~~

- 1.2. A large, expansile sphenoid mucocoele with multiple internal septations, alongside erosion of the clival and sellar floors near the internal carotid artery, was identified intraoperatively.

- 1.2.1. 2.1.1.

CONCLUSION:

~~Describe any important challenges or complications encountered during treatment and how they were managed~~

- 1.3. The main challenge encountered during treatment was safely opening each septation near the carotid artery and optic nerve without breaching the dura in dehiscence areas.

- 1.3.1. 2.9.1.

~~Describe how the patient's condition has progressed following treatment.~~

- 1.4. After the treatment, the patient recovered well, with resolution of symptoms and no recurrence at follow-up.

- 1.4.1. 2.14.1.

Ethics Title Card

This research has been approved by the Ethical Committee at Taif University

Protocol

2. Marsupialization of the Mucocele

Demonstrator: Narayanan Prepageran

2.1. After preparing the patient and inserting the endoscope, the sphenoid face was located using the posterior choana and nasal septum as landmarks. The anterior wall of the mucocele forming the sphenoid face was identified [1].

2.1.1. LAB MEDIA: 001_Sphm_exposure_A.mp4: 00:00 – 00:16

2.2. Next, the midline was localized using the nasal septum. The area of maximal bulging through the sphenoid face was identified. The most inferomedial and prominent portion of the anterior wall was selected as the entry point [1].

2.2.1. LAB MEDIA: 001_Sphm_exposure_A.mp4: 00:16-00:20

2.3. The planned entry site was cauterized using bipolar diathermy to minimize bleeding [1]. Using a Freer elevator, an incision was made at the identified entry point, and the opening was carefully widened to access the mucocele cavity [2].

2.3.1. LAB MEDIA: 002_Sphm_Marsupialization: 00:09 – 00:18

2.3.2. LAB MEDIA: 003_Sphm_Marsupialization: 00:03 – 00:18

2.4. Using straight suction, the mucocele contents were aspirated and the cavity was completely emptied under direct endoscopic visualization [1].

2.4.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 00:23-00:33, 00:50-01:00

2.5. After the initial drainage of the first mucocele compartment, the posterior sphenoid wall landmarks were identified [1].

2.5.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 01:03-01:15

2.6. The optic nerve prominence, the internal carotid artery prominence, and the opticocarotid recess were identified and confirmed on the posterior wall [1].

2.6.1. LAB MEDIA: 003_Sphm_Marsupialization: 01:19-01:30

2.7. Then, the mucocele septa were removed while maintaining continuous visualization of the posterior sphenoid landmarks [1].

2.7.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 01:19-01:30

2.8. The dissection proceeded medially first, then laterally, while the contents from each compartment were aspirated in sequence [1]. Using a curved suction, the lateral extensions were aspirated [2].

2.8.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 01:56-02:15, 03:40-03:50

2.8.2. LAB MEDIA: 004_Sphm_drainage.mp4: 01:21 – 01:32, 00:43-00:53

- 2.9. The dehiscent bone of the skull base was evaluated throughout the dissection. The underlying dura was confirmed to be intact at all sites of bony dehiscence before proceeding [1].
- 2.9.1. LAB MEDIA: 003_Sphm_Marsupialization Timestamps: 05:43-06:00
- 2.10. All remaining septations were removed, and the remaining mucocele contents were evacuated while maintaining continuous visualization of the sphenoid landmarks [2].
- 2.10.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 05:29 – 05:43
- 2.11. The dissection continued until all sphenoid sinus walls were clearly visualized. The cavity was fully marsupialized, and no residual compartments remained [1].
- 2.11.1. LAB MEDIA: 004_Sphm_drainage.mp4: 00:25-00:38, 01:42-01:52
- 2.12. The sphenoidotomy was further widened to establish a wide and durable drainage pathway [1]. Using through-cutting forceps and a Kerrison punch, the residual bone margins of the sphenoid face were removed [2].
- 2.12.1. LAB MEDIA: 003_Sphm_Marsupialization.mp4: 04:43-04:53
- 2.12.2. LAB MEDIA: 004_Sphm_drainage.mp4: 00:09-00:20
- 2.13. Afterward, the drainage was extended inferiorly to the sphenoid floor [1].
- 2.13.1. LAB MEDIA: 004_Sphm_drainage.mp4: 01:14-01:28
- 2.14. A comprehensive endoscopic examination of the entire sphenoid sinus cavity was performed. No residual mucocele material or septations remained, and the sinus was widely opened and successfully drained [1].
- 2.14.1. 005_Sphm_Final.mp4: 00:00– 00:10
- 2.15. The bilateral internal carotid artery and optic nerve prominences, opticocarotid recesses, sellar floor, and clivus were identified. Each area of bony dehiscence was examined to confirm dural integrity, and hemostasis was achieved [1].
- 2.15.1. 005_Sphm_Final.mp4: 00:11– 00:21

Results

3. Results

3.1. MRI of a 79-year-old male demonstrated a multiloculated, expansile lesion centered in the sphenoid sinus, predominantly on the right, extending across the midline, with heterogeneous internal signal intensity and multiple internal septations [1].

3.1.1. LAB MEDIA: Figure 1A–B.

3.2. Bony erosion involved the sellar floor and the right ICA canal. The pituitary gland and right ICA were intact [1].

3.2.1. LAB MEDIA: Figure 1C–D.

3.3. Inferiorly, the mid-clivus was also eroded, with the bilateral paraclival ICA segments flanking the mid-clival region, and the right paraclival ICA in closest proximity to the inferior part of the lesion [1].

3.3.1. LAB MEDIA: Figure 1E–F.

NOTE: Refer to the update section for highlighting

1. Sphenoid

Pronunciation link: <https://www.merriam-webster.com/dictionary/sphenoid>

IPA: /'sfɪːnɔɪd/

Phonetic Spelling: SFEE·noyd

2. Choana

Pronunciation link: <https://www.merriam-webster.com/medical/choana>

IPA: /'koʊ.ə.nə/

Phonetic Spelling: KOH·uh·nuh

3. Mucocoele

Pronunciation link: <https://www.merriam-webster.com/medical/mucocoele>

IPA: /'mjuː.kəˌsiːl/

Phonetic Spelling: MYOO·kuh·seel

4. Inferomedial

Pronunciation link: No confirmed link found

- IPA: No verified IPA available
Phonetic Spelling: in·feer·oh·MEE·dee·uhl
5. Diathermy
Pronunciation link: <https://www.merriam-webster.com/dictionary/diathermy>
IPA: /'daɪ.ə.θɜː.mi/
Phonetic Spelling: DYE·uh·thur·mee
6. Freer elevator
Pronunciation link: No confirmed link found
IPA: No verified IPA available
Phonetic Spelling: FREER EL·uh·vay·ter
7. Endoscopic
Pronunciation link: <https://www.merriam-webster.com/dictionary/endoscopic>
IPA: /,ɛn.də'skɑː.pɪk/
Phonetic Spelling: en·duh·SKOP·ik
8. Opticocarotid
Pronunciation link: No confirmed link found
IPA: No verified IPA available
Phonetic Spelling: op·tih·koh·kuh·ROT·id
9. Carotid
Pronunciation link: <https://www.merriam-webster.com/dictionary/carotid>
IPA: /kə'rɑː.tɪd/
Phonetic Spelling: kuh·ROT·id
10. Septa
Pronunciation link: <https://www.merriam-webster.com/dictionary/septum>
IPA: /'sep.tə/
Phonetic Spelling: SEP·tuh
11. Dehiscent
Pronunciation link: <https://www.merriam-webster.com/dictionary/dehiscent>
IPA: /dɪ'hɪs.ənt/
Phonetic Spelling: dih·HISS·uhnt
12. Dehiscence
Pronunciation link: <https://www.merriam-webster.com/dictionary/dehiscence>
IPA: /dɪ'hɪs.əns/
Phonetic Spelling: dih·HISS·uhns
13. Dura
Pronunciation link: <https://www.merriam-webster.com/dictionary/dura>
IPA: /'dʊr.ə/
Phonetic Spelling: DUR·uh
14. Marsupialized
Pronunciation link: No confirmed link found
IPA: No verified IPA available
Phonetic Spelling: mar·SOO·pee·uh·lyzd
15. Sphenoidotomy
Pronunciation link: No confirmed link found

- IPA: No verified IPA available
Phonetic Spelling: sfee·noy·DOT·uh·mee
16. Kerrison
Pronunciation link: <https://www.merriam-webster.com/medical/Kerrison%20rongeur>
IPA: /'ker.i.sən/
Phonetic Spelling: KAIR·ih·suhn
17. Hemostasis
Pronunciation link: <https://www.merriam-webster.com/dictionary/hemostasis>
IPA: /,hi:.mə'steɪ.sɪs/
Phonetic Spelling: hee·muh·STAY·sis
18. Multiloculated
Pronunciation link: No confirmed link found
IPA: No verified IPA available
Phonetic Spelling: mul·tee·LOK·yuh·lay·tid
19. Heterogeneous
Pronunciation link: <https://www.merriam-webster.com/dictionary/heterogeneous>
IPA: /,het̬.ə.roʊ'dʒi:.ni.əs/
Phonetic Spelling: het·uh·roh·JEE·nee·uhs
20. Sellar
Pronunciation link: <https://www.merriam-webster.com/medical/sellar>
IPA: /'sel.ər/
Phonetic Spelling: SEL·er
21. Pituitary
Pronunciation link: <https://www.merriam-webster.com/dictionary/pituitary>
IPA: /pi'tu:.ə'ter.i/
Phonetic Spelling: pih·TOO·uh·tair·ee
22. Clivus
Pronunciation link: <https://www.merriam-webster.com/medical/clivus>
IPA: /'klaɪ.vəs/
Phonetic Spelling: KLY·vuhs
23. Paraclival
Pronunciation link: No confirmed link found
IPA: No verified IPA available
Phonetic Spelling: pair·uh·KLY·vuhl
24. Bilateral
Pronunciation link: <https://www.merriam-webster.com/dictionary/bilateral>
IPA: /baɪ'læt̬.ər.əl/
Phonetic Spelling: bye·LAT·er·uhl