

RESULTS IN RESIDENT CHOLESTEATOMA SURGERY: A REVIEW OF 85 CASES*

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ABSTRACT

A review of all patients with cholesteatoma operated on by the residents of the New York Eye and Ear Infirmary under the attending supervision of the Otolaryngology Service between 1980 and 1984 was done. Of 130 resident cases, 85 had documented follow-up 1 year or longer and were included in the study. Recurrence rates were 18% with canal wall down (CWD) and 43% with canal wall up (CWU) techniques. Considering other forms of failure (such as precholesteatoma, tympanic membrane perforation, and chronic infection), overall failure rates were 33% (CWD) compared with 82% (CWU). Cholesteatoma recurrence failure rates were higher in patients under the age of 20 (33%) than over the age of 20 (18%). Overall failure rates were 61% and 37% for younger and older patients, respectively. Due to the high failure rate with canal wall up technique in the resident hands, it is recommended that resident service cases be treated with canal wall down technique, especially in the younger age group.

The primary purpose of surgical intervention in the management of cholesteatoma is to eradicate the disease process and leave the patient with a safe, dry ear. The controversy over whether canal wall down technique (CWD) or combined approach, canal wall up technique (CWU), offers the best chance for removal of disease and restoration of function is a topic extensively discussed in the literature.¹⁻⁶

A review of the otolaryngology literature of the last 5 years reveals that this controversy has not been considered from the standpoint of clinic cases where the primary surgeon is a resident. Therefore, a review of all cholesteatoma surgery performed at the New York Eye and Ear Infirmary over a 5-year period from 1980 through 1984, with emphasis on resident cases, was performed. Both CWU and CWD techniques were used and an analysis of the efficacy of the two methods in controlling the disease process is considered.

METHODS

Between 1980 and 1984, there were 285 operations performed for cholesteatoma at the New York Eye and Ear Infirmary. Of these, 130 were clinic cases in which a resident was the primary surgeon under the supervision of an attending on the Otolaryngology Service. The choice to perform CWU or CWD technique was decided by the individual surgeon. These cases were reviewed retrospectively, and 85 cases with documented follow-up for 1 year or longer are included in the study. Although 1 year follow-up is inadequate in assessing surgical efficacy in eradicating cholesteatoma, because of the frequent unreliability of the clinic patient population, significant numbers would not have been obtained had the follow-up limit for inclusion in the study been raised to 2 or more years. The remaining 45 resident cases had less than 1 year follow-up and were excluded from the study. Between patients with CWU or CWD procedures, no significant difference in the follow-up rate was noted.

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The efficacy of the two approaches (CWU and CWD) are compared based on parameters of failure outlined by Cody.¹ These include: 1. cholesteatoma; 2. precholesteatoma (development of an epitympanic retraction pocket or when the facial recess had been surgically opened, a facial recess retraction pocket); 3. chronic or frequent recurrent infection with or without tympanic membrane (TM) graft failure and not associated with cholesteatoma or precholesteatoma; 4. failure of TM graft without cholesteatoma, precholesteatoma, or infection.

The data was further analyzed from the standpoint of age by comparing results between patients 20 years and above and patients below 20. Differences in failure rates are noted and recommendations are made. The range for follow-up time was 1 year to 5 years, with an average of 2.1 years.

RESULTS

Canal Wall Down Procedures

Among the 85 patients, 62 had a CWD, open cavity approach of which 24 were radical mastoidectomies and 38 were modified radical mastoidectomies. Persistent or recurrent cholesteatoma was the cause of failure in 11 of the 62 open cavity cases for an incidence of 18%. The average time of follow-up before cholesteatoma was rediagnosed was 2.8 years.

There were six failures due to chronic or frequent recurrent infection for an incidence of 10%. Three cases failed because of TM graft failure (8%, excluding radical mastoidectomies). The overall failure rate was 35% for open cavity, CWD technique. Complications included two cases of partial facial paralysis due to injury to the facial nerve (3.2%). There were no cases of labyrinthine fistula, sensorineural hearing loss, dural tears, or cerebral spinal fluid leak.

Ten revisions were performed, including eight for residual cholesteatoma and two for chronic infection. All revisions had dry, safe cavities for an average follow-up period of 1.5 years.

Comparing modified radical mastoidectomy with radical mastoidectomy results in the patient population 20 years of age and over revealed that of

TABLE I
Overview Resident Failure Rates Compared with Cody.

	N.Y.E.E.I.		Cody	
	CWU	CWD	CWU	CWD
Number	28	62	171	172
Cholesteatoma	10 (48%)	11 (18%)	77 (45%)	12 (7%)
Precholesteatoma	1 (4%)	0 (0%)	28 (16%)	0 (0%)
Infection	5 (32%)	6 (10%)	0 (0%)	14 (8%)
T.M. failure	3 (18%)	8* (8%)	8 (5%)	6† (4%)
Overall	19 (82%)	20 (35%)	113 (68%)	32 (19%)

*Radical Mastoidectomies excluded #=38; †Radical Mastoidectomies excluded #=85.

25 modified radical mastoidectomies 5 failed due to cholesteatoma (20%), 2 failed due to TM reoperation (8%), and 3 failed due to chronic infection (12%) for an overall failure rate of 40%. There were 15 radical mastoidectomies done in the same age group with no failures (0%).

Canal Wall Up Procedures

There were 23 cases where CWU, combined approach tympanoplasty was used for the surgical removal of cholesteatoma. Ten failed because of cholesteatoma (43%), 5 failed due to chronic infection (22%), 3 failed because of TM graft failure (13%), and 1 failed due to precholesteatoma (an attic retraction) (4%). The overall failure rate was 82%.

There were 11 revisions performed on the 23 CWU cases. Nine were for cholesteatoma failure and two due to chronic infection. Seven of the 11 revisions used CWD technique. The other four revisions left the canal wall intact. Of the seven revisions done using CWD methods, one required a second revision for recurrent cholesteatoma 1 year later. Three were lost to follow-up and the remaining three had clean, dry cavities for an average follow-up of 2 years.

Of the four revisions performed utilizing CWU technique, two failed; one due to cholesteatoma 6 years later, the other due to TM perforation 4 years later. The other two CWU revisions had dry, disease-free ears for an average of 2 years postoperatively.

By Age

In patients 20 years of age and older there were 52 cases performed (both CWU and CWD) with 10 failures due to cholesteatoma (19%), 3 TM perforations (6%), 6 failures from chronic infection (12%), and no failures noted for precholesteatoma for a total of 19 failures (37%).

For patients under 20 there were 33 total cases (CWU and CWD) with 11 cholesteatoma failures (33%), 3 TM failures (9%), 5 failures for chronic infection (15%), and 1 precholesteatoma failure (3%) for an overall result of 20 out of 33 failures (61%).

DISCUSSION

CWU vs CWD Overall

The cholesteatoma failure rate for CWU was 48% (10/23) compared with 18% (11/62) for CWD. The overall failure rate including TM graft failure, chronic infection, and precholesteatoma as well as cholesteatoma was 82% (19/23) CWU vs. 33% (20/62) CWD.

Cody showed cholesteatoma failure rates of 35% CWU and 16% CWD.¹ Overall failure rates for CWU and CWD were 60% and 18%, respectively. These same cases were followed an additional 6 years and cholesteatoma failure rates increased to 45% (CWU) and 7% (CWD), while overall failure rates climbed to 68% (CWU) and 19% (CWD). He also analyzed results in an obliterated cavity series which we did not do.

The results in our series of resident cases compare well with the results reported by Cody. However, the cholesteatoma failure rate is particularly high in cases done by residents using CWU technique (especially considering the shorter follow-up time). It is our recommendation that the CWD technique should be strongly urged in clinic cases performed by residents. The often questionable reliability of clinic patients returning for follow-up further emphasizes this recommendation.

Cholesteatoma by Age

Various authors have demonstrated that cholesteatoma in children is more aggressive than in adults and have argued against the widespread application of intact canal wall procedures, particularly in children.^{1,2,7,8} When CWU technique is used, a planned second stage procedure has been recommended to deal with residual cholesteatoma. Our data suggests that cholesteatoma is a more aggressive disease in patients under 20. The cholesteatoma failure rate for both techniques (CWU and CWD) was 19% (10/52) in patients 20 and over, compared with 33% (11/33) in younger patients. Overall failure rates were 37% (19/52) and 61% (20/33) for older and younger patients, respectively. Glasscock and associates³ reported cholesteatoma failure rates of 15% and 23% in adults and children respectively, using 16 as his cutoff age. Our analysis further supports the premise that cholesteatoma is a more aggressive disease in children and that CWD technique, particularly in residents' hands, is the preferred approach. If CWU technique is used, the patient should be forewarned that a planned second stage procedure may be necessary.

CONCLUSIONS

1. In resident cases, when dealing with cholesteatoma, CWD technique is strongly recommended.
2. Cholesteatoma appears to behave more aggressively in patients under 20. In this age group, resi-

dents should be strongly advised to use CWD technique.

3. Long-term follow-up of all cholesteatoma patients is required.

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XIVTH WORLD CONGRESS OF OTORHINOLARYNGOLOGY.

The XIVth World Congress of Otorhinolaryngology will be held June 11-16, 1989, under the auspices of the International Federation of Otorhinolaryngological Societies (IFOS). Held only once every four years, this prestigious scientific, social and cultural event will draw an expected attendance of 10,000 persons, including 5,000 to 6,000 otolaryngologists. Simultaneous translation featuring English, Spanish, French, German and Japanese will bring together specialists from all continents in exchange of scientific knowledge and will strengthen fellowship among people from all over the world.

An elaborate social program during the meeting will provide ample opportunity for the spouses and companions to enjoy shopping, fashion shows, sightseeing, and sunning and swimming. Evening functions will allow ample time for relaxation and social interchange.

For additional information, contact: Alvarez Vicent, MD, Secretary General, Villanueva 11, 28001 Madrid, Spain; (84) 1 481 26 92.

FIRST ANNUAL MEDICAL COLLEGE OF GEORGIA POSTGRADUATE PATHOLOGY SYMPOSIUM.

The First Annual Medical College of Georgia Postgraduate Pathology Symposium will be held May 9-10, 1987. The purpose of the symposium is to present current information and future perspectives that are applicable to the practice of pathology.

The major topic will be Surgical Pathology of the Head and Neck and will be presented by Dr. Vincent Hyams, distinguished scientist and Chairman, Emeritus, Otolaryngic Pathology Department, Armed Forces Institute of Pathology, Washington, DC.

In addition, there will be workshops as well as updates in several pertinent topics.

For further information, contact: William C. Allsbrook, Jr., M.D., Department of Pathology, Medical College of Georgia, Augusta, GA 30912-0300.

ROBERT E. FECHNER, MD, SECTION EDITOR

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PATHOLOGIC QUIZ CASE 1

Richard M. Moss, MD; Tung P. Poon, MD; Pi-Tang Lin, MD, New York

A 69-year-old man complained of intermittent left-sided epistaxis and nasal obstruction for several years. Physical examination disclosed a

pink-gray polypoid mass filling the upper left nasal cavity. The right nasal cavity and nasopharynx were clear. Multiple biopsy specimens were

obtained. The microscopic findings are shown in Figs 1 and 2.

What is your diagnosis?

PATHOLOGIC QUIZ CASE 2

Timothy R. Jones, MD, Robert W. Cantrell, MD, Charlottesville, Va

A 60-year-old woman presented with progressive nasal obstruction of eight months' duration. Fiberoptic examination at that time disclosed edema of the right middle turbinate, but the nasal cavity and nasopharynx were normal.

Examination disclosed a right nasal mass thought to be a choanal polyp. Sinus roentgenograms were normal. A

biopsy of the nasal mass was performed; with more than 1 unit of blood loss. A computed tomographic scan performed following this procedure showed a lesion filling both nasal cavities and the nasopharynx. There was opacification of the right anterior ethmoid and maxillary sinuses, but no bony destruction. The lesion had eroded through the septum and filled both

nasal cavities and the nasopharynx.

A tan, pedunculated, nonulcerated mass protruding from the right middle turbinate (Fig 1) was surgically removed.

The excised mass was submitted for histologic examination (Figs 2 and 3).

What is your diagnosis?

Residents and fellows in otolaryngology are invited to submit quiz cases for this section and to write letters to the ARCHIVES commenting on cases presented. Quiz cases should follow the patterns established and must be submitted in duplicate. Photomicrographs must be clear and can include an outline drawing with important structures labeled, especially in the case of histopathology of the ear. Illustrations must be submitted as positive color transparencies (35 mm preferred). Do not submit color prints unless accompanied by original transparencies. Transparencies should be carefully packaged in a separate container. Please do not submit glass-mounted transparencies or the actual glass histology slides. Material for the RESIDENTS PAGE should be mailed to the Chief Editor.

Reprints not available.

PATHOLOGIC QUIZ CASE 1

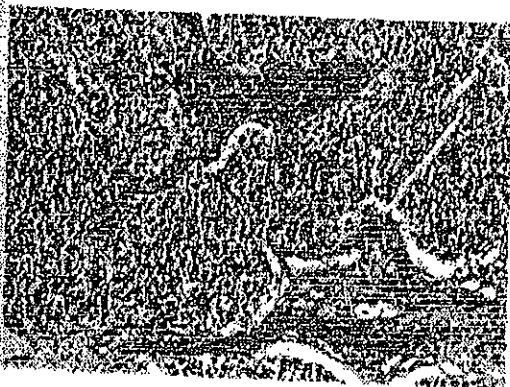


Figure 1.

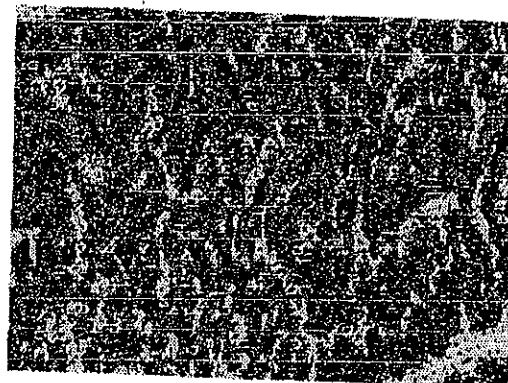
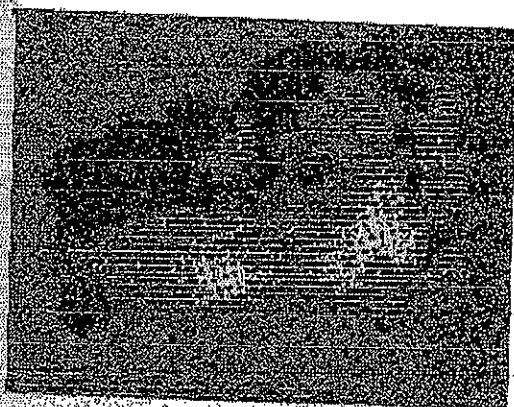


Figure 2.

Microscopic findings
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Diagnosis?

PATHOLOGIC QUIZ CASE 2



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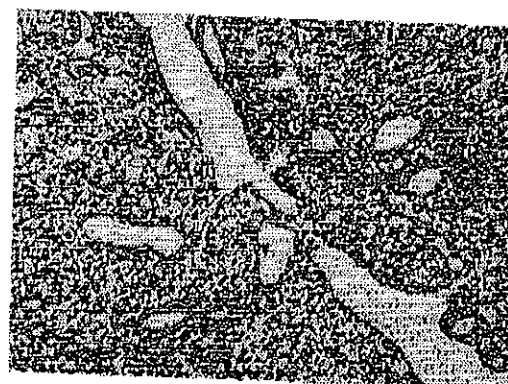


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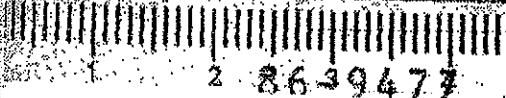


Figure 1.

PATHOLOGIC QUIZ CASE 1

Pathologic Diagnosis: Olfactory neuroblastoma.

The diagnosis of olfactory neuroblastoma can usually be made by light microscopy. The presence of a fibrillary intracellular background is needed for a conclusive diagnosis. The fibrils have been shown ultrastructurally to represent neuronal cell processes.¹

In the undifferentiated olfactory neuroblastoma, electron microscopy is often needed to distinguish it from embryonal rhabdomyosarcoma, undifferentiated lymphomas, undifferentiated epidermoid carcinoma, plasmacytomas, transitional cell carcinoma, and others. Electron microscopy can detect neurites and secretory granules compatible with catecholamine granules that are diagnostic of olfactory neuroblastoma.² Sympathetic neuroblastoma and a typical olfactory neuroblastoma are virtually identical by light microscopy. The similarity continues at the ultrastructural level, indicating that the ultrastructural characteristics of neuroblasts are similar regardless of location or presumed origin.³ Micheau and coworkers⁴ demonstrated the presence of dopamine-B-hydroxylase and catecholamines, using immunohistochemical and biochemical studies, indicating the likelihood that olfactory neuroblastoma is of sympathetic origin. They recommended assays of urinary vanillylmandelic acid (VMA), dopamine, and homovanillic acid to gain further information about the nature of olfactory neuroblastoma and its diagnosis. Taxy and Hidvegi⁵ noted that the level of B-hydroxylase in olfactory neuroblastoma is 100 times less than that observed in sympathetic neuroblastoma. No systemic manifestations of catecholamines from olfactory neuroblastoma have been noted.

Although it is a slow-growing tumor, olfactory neuroblastoma has a

significant rate of metastasis. Bailey and Barton⁶ noted a 24% incidence (40/165 patients) of metastases. The most common sites, in order of decreasing frequency, are the cervical lymph nodes, lungs and pleura, long bones, spinal column, breast, and abdominal viscera. Death results from distant or local metastasis or intracranial extension leading to meningitis and/or hemorrhage.

Treatment for olfactory neuroblastoma has remained controversial. In a review involving 97 cases, Skolnik et al⁷ reported five-year survival rates of 64% with radical surgery, 38% with radiation, and 50% using a combination of surgery and radiation. They recommend surgery, reserving radiation for persistent or recurrent tumors or unresectable lesions. Cantrell et al⁸ recommended combined therapy, including preoperative radiation and radical surgery.

Doyle and Paxton⁹ used a combined neurosurgical and otolaryngologic approach to olfactory neuroblastoma. A craniotomy performed by neurosurgery would enable assessment of the resectability of the tumor. The procedure could then be abandoned if indicated. If appropriate, an en-bloc excision of the cribriform plate and pansinusectomy could be performed.¹ The defect is repaired using preserved dural graft. They also advised radical neck dissection in cases with clinical cervical adenopathy.

The surgical management as described by Bailey and Barton⁶ emphasized adequate excision of tumor, usually through a lateral rhinotomy approach with resection of the lateral wall of the nose, including tumor extending into the ethmoid cells, sphenoid, orbit, or pterygoid space and, in some cases, resection of the cribriform plate. Chemotherapy has not been sufficiently used to properly assess its efficacy in treating olfacto-

ry neuroblastoma.

Olfactory neuroblastoma is a rare malignancy of the head and neck that often requires diagnosis through the use of electron microscopy. The work-up must involve accurate radiographic imaging to assess the extent of the tumor. Particular attention must be given to whether or not the cribriform plate is involved. If there is involvement of the cribriform plate, then a combined otolaryngologic-neurosurgical procedure should be used, with en-bloc resection of the cribriform plate combined with removal of the appropriate paranasal sinuses and wall of the nose. If the cribriform plate is not involved, then the preferred surgical approach is through a lateral rhinotomy. Furthermore, if clinical cervical adenopathy is present, a radical neck dissection should be performed. With evidence of distant metastatic disease or in the case of an unresectable lesion, radiation should be used. Radiation may be used for recurrence as well. Lifelong follow-up examination is essential to rule out recurrence or persistence.

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