Inverted Papilloma of the Nose and Paranasal Sinuses: Treatment Outcomes of 76 Cases

Young Chang, M.D., Jae Ho Kim, M.D., Yong-Jae Kim, M.D., Jung-Eun Shin, M.D. and Bong-Jae Lee, M.D.

ABSTRACT

To learn the long-term effects of surgical treatment for inverted papilloma, we retrospectively studied 76 patients who underwent surgery for inverted papilloma between March 1990 and June 1997 and who followed up for at least one year. The patient pool consisted of 65 males and 11 females, and their ages ranged from 29 years to 81 years (mean age 52 years). Twenty-eight patients (37%) had a history of previous nasal surgery, performed to treat nasal polyps with or without sinusitis. Conservative surgery resulted in four recurrences (16%) out of 25 patients, while medial maxillectomy resulted in three recurrences (6%) out of 47 patients. Endoscopic removal was performed in eight patients and resulted in one recurrence. Due to complications related to a medial maxillectomy, seven cases developed epiphora caused by stenosis of the lacrimal opening in the nasal cavity. The overall recurrence rate was 9%. Tumors recurred in four (67%) out of the six patients with associated carcinoma, one (13%) out of the eight patients with atypia, and two (3%) out of the 62 patients with inverted papilloma only. In conclusion, a preoperative biopsy is recommended for any unilateral polypoid nasal mass developed in adults. Medial maxillectomy may reduce the recurrence of inverted papilloma in spite of its disadvantages, which include external scarring and epiphora. Patients, especially those with associated atypia or carcinoma, should be followed up regularly for several years because of the high recurrence rate.

KEY WORDS Inverted papilloma · Medial maxillectomy · Treatment outcome · Nose · Paranasal sinus.

INTRODUCTION

Although inverted papilloma is histopathologically a benign tumor, it destroys bone mass by erosion, its aggressive growth often extends into the lamina papyracea or skull base, it has a tendency to recur and it is associated with squamous cell carcinoma. For these reasons, inverted papilloma is clinically considered to be malignant, and should therefore be treated with wide surgical resection and continuous postoperative follow-ups.

Inverted papilloma typically originates in the regions of the middle meatus and often extends into the maxillary and ethmoid sinuses. For treatment of these lesions, a medial maxillectomy has generally been thought of as the proper course of action. Recent advancements in endoscopic surgical procedures, however, have made excellent visualization of the origin and extent of the tumor possible, and more conservative resection of these lesions, reached by appropriate endoscopic tools, has been reported with good postoperative results.

The authors aimed to investigate the surgical outcomes of 76 patients who were diagnosed with inverted papilloma through histopathologic examination and who underwent surgical treatment. Analysis of the treatment outcomes was based on surgical modalities and histopathological patterns.

MATERIALS AND METHODS

The study group consisted of 76 patients who had received surgical treatment for inverted papilloma between March 1993 and June 1997 and follow-up treatments for at least one year. The average age of the patients was 51.8 years, with ages ranging from 14 to 81 years, and the male-to-female ratio was 5.9:1 (65 males and 11 females) (Table 1).

In cases where the patient was diagnosed with inverted papilloma via endoscopic nasal examination and punch biopsy, the tumor’s extension into the surrounding anatomical structures was confirmed and identified with computed tomography (CT). During the postoperative follow-up, a biopsy was per-
formed if a suspicious lesion was detected endoscopically in cases of confirmed recurrence, CT was performed.

Medical records and radiological data were reviewed and analyzed retrospectively for radiological, surgical and histopathological findings including associations with squamous cell carcinoma, different surgical methods and recurrence rates.

**RESULTS**

Twenty-eight out of the 76 patients had a history of operations such as nasal polypectomy, Caldwell-Luc’s operation, and intranasal ethmoidectomy (Table 2).

Intraoperative observation revealed that the middle meatus was the structure most frequently involved, with an incidence of 70 out of 76 patients (92%). In 16 of the 70 patients, the tumor was limited to the middle meatus, with no involvement of the surrounding sinuses. There were 41 (54%) cases involving the maxillary sinus and 38 cases (50%) involving the ethmoid sinus. That is to say, the tumor extended to both the maxillary and ethmoid sinuses in more than half of the cases studied, whereas the frontal sinus and the sphenoid sinus were rarely invaded. Of the six cases where there was no involvement of the middle meatus, four cases involved lesions limited to the maxillary sinus and the remaining two, to the nasal septum (Table 3).

Conservative treatment modalities were carried out in 25 cases. These modalities involved the following intranasal excision of the tumor in five cases and Caldwell-Luc’s operation in 12 cases and endoscopic excision of the tumor in eight cases.

A wide resection was carried out in 51 cases and involved the following median maxillectomy in 47 cases Denker’s operation in three cases and a radical maxillectomy with orbital exenteration in one case, where there was involvement of the orbit with a high grade of dysplasia protruding through the alveolar process. In the 47 cases involving a median maxillectomy, a lateral rhinotomy was applied in 41 cases and the midfacial degloving approach was applied in six cases (Table 4).

The complications that arose following these procedures were analyzed. In virtually all patients who underwent a median maxillectomy, the scar caused by the lateral rhinotomy was hardly noticeable after six months in only one case, a noticeable depression remained in the region of the median maxillectomy. Out of the 47 cases of median maxillectomy, epiphora due to obstruction of the nasolacrimal duct developed in seven cases and in five of these seven cases, an endoscopic dacryocystorhinostomy was performed to relieve the symptom. The other two patients refused treatment. The patient who underwent the radical maxillectomy with orbital exenteration has been disease-free for postoperative three years. However,
Table 5. Pathology of the surgical specimens and pathology-related recurrences

<table>
<thead>
<tr>
<th>Pathology</th>
<th>No. of cases</th>
<th>No. of recurrences (%)</th>
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<tbody>
<tr>
<td>Inverted papilloma (IP)</td>
<td>62</td>
<td>2 (3)</td>
</tr>
<tr>
<td>IP with atypia or dysplasia</td>
<td>8</td>
<td>1 (13)</td>
</tr>
<tr>
<td>IP with carcinoma</td>
<td>6</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>7 (9)</td>
</tr>
</tbody>
</table>

the orbital apex was not fully covered by the skin graft and a crust formation accompanied by chronic purp was observed. The surgical defect was covered up with the use of a palatal obturator, an orbital prosthesis, and glasses.

Biopsies of all 76 intraoperatively obtained specimens confirmed the histopathological reports of inverted papilloma. Sixty-two (82%) indicated inverted papilloma only, eight (11%) were observed to partially contain atypia or dysplasia and six (8%) showed associations with carcinoma (Table 5).

In the 76 patients, seven (9%) recurrences were discovered after the first surgical procedure. Among these seven, three were found within one month after the operation. Categorized according to surgical procedure, three (5.9%) recurrences were found among the 51 cases of wide surgical excision and four (16%) recurrences, among the 25 cases of conservative surgical excision (Table 4). In studying the correlation between a histopathological diagnosis and the tendency of recurrence, two (3%) recurrences were found out of the 62 cases involving only inverted papilloma. There was one (13%) recurrence out of the eight cases involving atypia or dysplasia and four (67%) recurrences out of six cases involving associated carcinoma (Table 5). A significantly higher tendency of recurrence was observed in cases with atypia or associated carcinoma. Additional histopathological study of the seven recurrences revealed that three involved simple inverted papilloma, one indicated some dysplasia, and three were found to be associated with carcinoma.

For treatment of the recurrences, one patient underwent Denker’s operation, while the others underwent endoscopic endonasal excision. In one patient, who had already undergone a medial maxillectomy as a secondary treatment, the tumor recurred for a second time and eventually was treated with endoscopic endonasal excision. Three patients underwent operations for the recurrent tumors and did not show a second recurrence. Of the remaining four cases of recurrence, one patient with associated carcinoma underwent radiation therapy, which was unsuccessful due to osteoradionecrosis, and the other three either refused further treatment or were lost during their follow-ups.

**DISCUSSION**

Inverted papilloma is often mistaken for a nasal polyp and responded to with inappropriate surgery, especially by inexperienced clinicians. Myers et al. report a medical history of surgical procedures for nasal polyps in 13 (50%) out of 26 cases of inverted papilloma and six (86%) out of seven cases of inverted papilloma associated with squamous cell carcinoma. The authors also encountered a medical history of surgical procedures performed under a misdiagnosis of chronic paranasal sinusitis with nasal polyp in 28 (36.8%) out of 76 cases. The tendency toward misdiagnosis is probably a result oficians’ overlooking the fact that, for patients exhibiting a unilateral nasal mass, inverted papilloma should be included in the differential diagnosis. Not performing a preoperative biopsy can also lead to misdiagnosis.

Among the 76 patients studied, 18 (23.7%) cases of inverted papilloma had been originally misdiagnosed as chronic sinusitis with nasal polyp and was later discovered through biopsy of the surgical specimens. This indicates the need for a preoperative histopathologic study of nasal cavity masses, especially of unilateral masses. Furthermore, because nasal polyps often coexist with inverted papilloma or inverted papilloma with squamous cell carcinoma, a biopsy should be carried out in various locations.

To decide the appropriate surgical procedure, imaging, such as a CT scan, and pathological diagnosis are needed. A preoperative punch biopsy rarely detects focal lesions of associated carcinoma in this study, only one out of the 14 cases involving associated carcinoma or dysplasia was accurately diagnosed with a preoperative biopsy. Discovery of the co-existence of carcinoma was made only after a thorough microscopic examination of whole surgical specimens. The coincidence rate of carcinoma and inverted papilloma varies from four to 32%. According to the Korean literature on inverted papilloma, the coincidence rate ranges from 5 to 11%. This study yielded a 9.2% rate. Inverted papilloma is reported to be associated mostly with squamous cell carcinoma but also with adenocarcinoma, transitional cell carcinoma and carcinoma in situ.

The treatment of inverted papilloma requires a complete and wide surgical resection of the tumor. Radical and complete resection of the tumor with sufficient exposure, therefore, has usually been the recommended treatment for inverted papilloma, and a medial maxillectomy, accompanied by a lateral rhinotomy, has been thought to be the most definite surgical treatment. A medial maxillectomy is an operation performed to achieve en bloc resection of the lateral nasal wall with portions of the adjacent maxillary and ethmoid sinuses. The procedure results in scarring and occasionally a depressed resection margin of the face, causing cosmetic problems. Epiphora due to obstruction of the nasolacrimal duct can also occur.

For the past two years, the authors have been employing endoscopic surgery as an alternative procedure when the extent of the tumor is sufficiently visible and accessible with endos-
The advantages of this method are less postoperative morbidity, the absence of external scarring and potential cosmetic deformity, and shorter (2-3 days) hospitalization.

Raveh et al. analyzed the recurrence rate in 1,036 cases according to different surgical methods after classical and conservative surgical removal, 295 (61%) out of 485 cases suffered recurrences after endoscopic nasal surgery, nine cases (17%) out of 52 had recurrences and after radical surgical procedures, such as a medial maxillectomy, 67 (13%) out of 502 cases showed recurrences. The recurrence rate obtained by the authors of the present study was seven out of a total 76 cases, or 9%. The low recurrence rate was probably due to the fact that radical surgical procedures, such as a medial maxillectomy, was the recommended treatment for inverted papilloma. The three recurrences that arose even after a wide resection were those involving squamous cell carcinoma. One-third of the patients with associated carcinoma or dysplasia demonstrated recurrence and this recurrence rate was 10 times higher than in patients with inverted papilloma only. Two-thirds of the patients with associated carcinoma displayed recurrence, and a strong correlation between the histopathological diagnosis and the tendency toward recurrence was observed.

Weissler et al. studied the length of time between surgery and recurrence 45% of patients had a recurrence-free period of one year for 35% of patients, this period was two to five years after surgery and for 17%, more than five years. This data indicates that recurrence can occur even after a long period of time and emphasizes the need for longer follow-up periods after surgical treatment.

Radiation therapy is known to be ineffective in the management of inverted papilloma and in the prevention of recurrence. Furthermore, the procedure may induce malignant transformation and osteoradionecrosis. In contrast, Weissler et al. report that six out of nine patients irradiated for associated malignancies in their study demonstrated a complete response and were alive without disease with a mean follow-up of 4.8 years.

The authors suggest that the choice of surgical procedure be based on the extent and pathology of the tumor endoscopic removal is recommended for inverted papilloma confined to the middle meatus and adjacent areas, which can be reached and completely removed with endoscopic surgical instruments. Caldwell-Luc’s operation in combination with endoscopic techniques can be used for a lesion involving the maxillary sinus for lesions extending to the ethmoid sinus and the maxillary sinus, a medial maxillectomy via a lateral rhinotomy or midface degloving procedure is recommended as radical surgery, such as a total maxillectomy or a radical maxillectomy, is to be considered when the preoperative biopsy reveals a coexisting malignancy or when a CT scan shows infiltrating destruction of the bony walls.

**CONCLUSION**

The results of this study indicate a great need for preoperative histopathological confirmation through a punch biopsy of the unilateral nasal polyoid lesions in adult patients. Endoscopic endonasal surgery, due to its advantages of a low recurrence rate and less postoperative morbidity, is an appropriate form of primary treatment for lesions that can be sufficiently visualized and easily reached with endoscopic surgical instruments. For more advanced tumors, a medial maxillectomy is generally accepted treatment of choice due to its low recurrence rate, but may cause cosmetic scarring and epiphora. Treatment of inverted papilloma, especially cases involving dysplasia or malignancy, requires a long period of follow-up due to its high recurrence rate.

**REFERENCES**


