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Benign Nasosinus Tumors: Epidemiological, Clinical, Morphological, Therapeutic, and Evolutionary Aspects at the Adolphe SICE General Hospital in Pointe-Noire (Congo-Brazzaville)

Sylvain Diembi[1*], Sydney Frousse Christian Ngatali[2], Harol Boris Otouana[3], Gérard Chidrel Gouoni[3], Franck Itiere Odzili[3], Donatien Moukassa[4], Gontran Ondzotto[3]

[1]ENT Department, Adolphe SICE General Hospital, Pointe-Noire, Congo
[2]Oncology Department, Loandjili General Hospital, Pointe-Noire, Congo
[3]ENT Department, Brazzaville Hospital and University Center, Brazzaville, Congo
[4]Master's Department, Health & Human Biology, FSSA, UMNG, Brazzaville, Congo
Email: *diembisylvain@gmail.com

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Abstract

Introduction: Benign nasosinus tumors (BNST) of epithelial origin are relatively rare and arise from the various lining tissues of the nasal and sinus cavities, and from glands developed from these epithelial invaginations. These include nasosinusal polyps, pleiomorphic adenoma and inverted papilloma. The aim of our study was to investigate the epidemiological, clinical, morphological, therapeutic, and evolutionary particularities of these three clinical entities, including two tumors with the potential for progressive malignancy (pleiomorphic adenoma and inverted papilloma) and one strictly benign tumor with a favorable evolution (nasosinus polyp or Schneider polyp). **Materials and Methods:** This was a retrospective, analytical, cross-sectional study conducted from January 1, 2006 to December 31, 2019 (13 years), in the Department of Otolaryngology and Cervicofacial Surgery at Adolphe SICE Hospital, Pointe-Noire, Congo-Brazzaville. **Results:** During the study period, 74 patients were registered for a nasosinus tumor, of which 23 were benign tumors of epithelial origin (31%) distributed as follows: 15 cases of nasosinus polyp, 5 cases of pleomorphic adenoma and 3 cases of inverted papilloma. The mean age was 42.5 for polyps, with an estimated median of 38, and 42.9 for the other two entities (pleomorphic adenoma and inverted papilloma), with an estimated median of 41. Nasosinus allergy accounted for 17% of cases, followed by chronic sinusitis (12%); however, in 49% of cases, the patient's

history was not specified. There was no sexual predominance, the sex ratio being 1.08. Occupation, socio-economic level, and education had no impact on the development of these tumors. Most of our patients (52%, 12 cases) had a consultation delay of more than one (1) year, whatever the histological nature of the tumor. The complete nasosinus syndrome (NSS) included nasal obstruction, rhinorrhea, epistaxis, and anosmia, and was found in 19 cases (83%), most often reflecting a nasosinus polyp. CT scans were performed in all patients, with hyperdense images predominating in 22 cases. Management of benign nasosinus tumors was mainly surgical. Postoperative management was straightforward in 15 cases (65%). **Conclusion:** Benign nasosinus tumors are dominated by nasosinus polyps. Management of these tumors is essentially surgical, with the best clinical outcome.

Keywords

Nasosinus Polyp, Pleomorphic Adenoma, Inverted Papilloma, Epidemiology, Clinical Features, Therapeutic Management

1. Introduction

Benign nasosinus tumors (BNSTs) of epithelial origin are relatively rare and arise from the lining epithelium of the nasal and sinus cavities, and from glands developed from epithelial invaginations. The three most common pose problems of diagnosis of certainty prior to surgical management. These include nasosinusal polyps, pleiomorphic adenomas and inverted papillomas [1]. In the literature, some cases of inverted papilloma associated with highly oncogenic human papillomaviruses (HPV16 and 18) have been reported in the context of malignant degeneration, as have exceptional cases of pleomorphic adenoma [2] [3]. Certain risk factors have also been reported, notably nasosinusal allergy and chronic sinusitis [1]. The complete nasosinus syndrome associating nasal obstruction, rhinorrhea, epistaxis, and anosmia is the clinical argument for discussing the hypothesis of these entities without diagnostic certainty apart from histological confirmation of the surgical specimen.

In professional environments with limited resources, particularly in developing countries, these tumors pose a problem of diagnostic delay, often with aesthetic prejudice [4]. The aim of our study was to examine the epidemiological, clinical, therapeutic, and evolutionary particularities of these tumors, and to report on our experience in their therapeutic management in view of the limited technical resources available.

2. Materials and Methods

This is a retrospective, analytical, cross-sectional study conducted from January 1, 2006 to December 31, 2019, a period of 13 years, in the Otolaryngology and Cervicofacial Surgery Department of the Adolphe SICE Hospital in Pointe-Noire,

Congo-Brazzaville.

The general population consisted of patients referred to the department following a presumptive diagnosis of a nasosinus tumor. The study sample consisted of patients with histologically confirmed benign nasosinus tumors of epithelial origin. All non-processable files were excluded from the study.

A triple epidemiological, clinical and paraclinical survey was carried out to create a database of nasosinus tumors, as well as to collect therapeutic and evolutionary data from archived operating room records and from patients seen in medical consultations.

The study variables were epidemiological (age, sex, profession, socio-economic level, education), clinical (history, consultation delay, characteristics of symptoms and associated clinical signs, mode of onset, location), endoscopic, radiological, therapeutic, and evolutionary.

The anatomopathological study was carried out on surgical excisions of the polypoid formation, using 5 - 6 µm sections stained with hematoxylin and eosin. External macroscopic aspects and microscopic details were described: tumor architecture, cell arrangement, nature of the polyp lining, presence, or absence of histological criteria of malignancy (cytonuclear atypia, nucleocytoplasmic ratio, abnormal mitoses, neovascularization), presence or absence of koïlocytes associated or not with disorganization of the tumor epithelium. On histological examination, two (2) groups were formed: group n˚1 (G1), comprising patients with a nasosinus polyp (NSP), and group n˚2, comprising patients with either a pleiomorphic adenoma (PA) or an inverted papilloma (IP).

Univariate and bivariate statistical analysis was performed using Excel 2017 software to create the database and calculate proportions. An associativity relationship was sought between epidemiological, clinical, paraclinical and evolutionary variables, using the Chi-square test with a p-value of 0.05.

The present work was carried out in the context of scientific and hospital research. The epidemiological and clinical investigation guaranteed the confidentiality of patient data. There were no conflicts of interest.

3. Results

Univariate analysis yielded the following results of socio-demographic characteristics (Table 1). Bivariate analysis was used to investigate the clinical, morphological, therapeutic, and evolutionary particularities of three clinical entities observed in our study.

3.1. Relative Frequency

During the study period, we recorded a total of 74 patients treated for nasosinus tumors, 23 of whom had benign tumors (31%).

3.2. Age (Table 2)

The mean age was 42.5 for nasosinusal polyp, with an estimated median of 38,

Table 1. Socio-demographic characteristics of the study population.

	N case	Percentage (%)
Gender		
Male	11	48%
Female	12	52%
Total	**23**	**100%**
Professions		
Driver	1	4.35%
Secretary	1	4.35%
Student	1	4.35%
Retired	1	4.35%
Teacher	2	8.70%
Housewife	2	8.70%
Engineer	2	8.70%
Student	2	8.70%
Shopkeeper	5	21.74%
Hairdresser	6	26.09%
Total	**23**	**100.00%**
Socio-economic status		
Low	2	8.70%
Medium	8	34.78%
Good	13	56.52%
Total	**23**	**100.00%**
Education level		
Primary	5	20%
Secondary	9	40%
Tertiary (university)	9	40%
Total	**23**	**100%**

Table 2. Age distribution.

AGE	NSP (n case)	PA + IP (n case)	TOTAL
[20 - 29 years]	4	2	6
[30 - 39 years]	5	1	6
[40 - 49 years]	0	4	4
[50 - 59 years]	5	0	5
≥60 years	1	1	2
TOTAL	**15**	**8**	**23**

$p > 0.005$. NSP = naso-sinusal polyp; PA= pleomorphic adenoma; IP = inverted papilloma.

and 42.9 for the other two entities (pleomorphic adenoma and inverted papilloma), with an estimated median of 41. There was no significant difference ($p > 0.05$).

3.3. Clinical Aspects

Most of our patients (52%, 12 cases) had a consultation delay of more than one year, whatever the histological nature of the tumor (Table 3).

The complete nasosinus syndrome (NSS) included nasal obstruction, rhinorrhea, epistaxis, and anosmia, and was found in 19 cases (83%), most often reflecting a nasosinus polyp.

Nasosinus allergy accounted for 17% of cases, followed by chronic sinusitis (12%); however, in 49% of cases, the patient's history was not specified.

In these 22 cases, the complete sinus syndrome was associated with headache, and in 2 cases and 1 case respectively with facial pain and lacrimation (Table 4).

The onset of these symptoms was predominantly progressive in 23 cases (92%). Facial swelling was noted on inspection in 18 cases. This swelling affected the face (44%), cheek (2%), nasolabial fold (17%) and nasofrontal-orbital region (2%) respectively.

The location of benign nasosinus tumors was unilateral in 22 cases (88%), and bilateral in 3 cases (12%) (Table 5).

Anterior rhinoscopy revealed an endonasal mass in 22 cases (Figure 1), and nasal congestion in 1 case.

The physical examination included an endobuccal, otological and ophthalmological examination. On endobuccal examination with a tongue depressor, palatal cupping was found in 8 cases. Otoscopy revealed seromucosal otitis in 2 cases. Ophthalmological examination revealed unilateral exophthalmos in 4 cases,

Table 3. Consultation deadline.

Consultation deadline	NSP (n case)	PA + IP (n case)	TOTAL
<6 months	7	3	10
[6 - 12 months]	0	1	1
>12 months	8	4	12
TOTAL	**15**	**8**	**23**

$p > 0.005$.

Table 4. Clinic features.

Clinic Features	PNS (n case)	AP + PI (n case)	TOTAL
Complete NSS = NO + RH + EP + AN	14	5	19
Incomplete NSSs	1	3	4
TOTAL	**15**	**8**	**23**

Nasosinusal syndrome (NSS) = nasal obstruction (NO), rhinorrhea (RH), epistaxis (EP), and anosmia (AN).

Table 5. Tumor localization.

Localization	PNS (n case)	AP + PI (n case)	TOTAL
Bilateral	3	0	3
Unilateral	**12**	**8**	20
TOTAL	15	8	23

$p > 0.005$.

Figure 1. Microphotograph of a nasosinusal polyp visible on physical examination of the nasal canal.

with visual acuity maintained.

3.4. Morphological Aspects

CT scans were performed in all patients, with hyperdense images predominating in 22 cases.

The most common histological type was nasosinus polyp in 15 cases (Figure 2 and Figure 3), followed by pleomorphic adenoma in 5 cases, and inverted papilloma in 3 cases (Table 6).

3.5. Therapeutic and Evolutionary Data

Management of benign nasosinusal tumors was mainly surgical, with three types of procedure performed: endoscopic (2 cases), vestibular (6 cases), CADWELL-LUC (4 cases) and DEGLOWIG (2 cases), and transfacial routes in 17 cases represented by the paralateronasal route of MOURE and SIBELIAU with a few variations (Table 7, Figure 4 and Figure 5).

The postoperative course was mostly straightforward in 16 cases (64%), with complications observed in 9 cases (36%); these depended on the therapeutic approach, with the transfacial approach accounting for 6 complications (Table 7).

Figure 2. Macroscopic appearance of nasosinusal polyp, 2 cm maximum diameter.

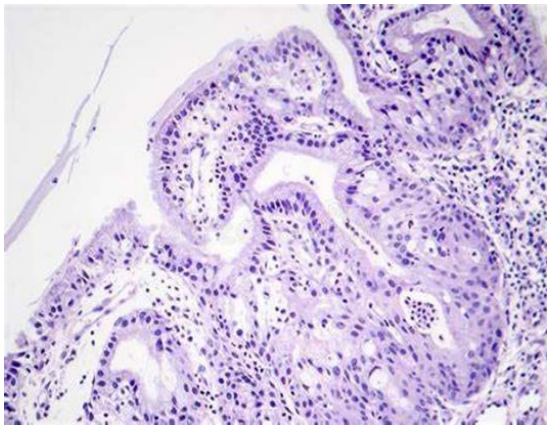

Figure 3. Microscopic appearance of nasosinusal polyp with a respiratory epithelial lining and focal metaplasia.

Table 6. Distribution by type of histology.

HISTOLOIC FEATURES	N CASE	PERCENTAGE (%)
Inverted Papilloma (IP)	3	12%
Pleiomorphic adenoma (PA)	5	20%
Naso-sinusal polyp (NSP)	**15**	**60%**
TOTAL	23	100%

$p > 0.005$.

Table 7. Breakdown of postoperative findings by surgical procedure.

TYPE OF PROCEDURE SURGICAL	FOLLOW-UP		TOTAL
	Simple	Complicated	
Endoscopic pathways	2	-	2
Vestibular pathways	4	2	6
Transfacial pathways	10	7	17
TOTAL	16	9	25

$p > 0.005$.

Figure 4. Intraoperative microphotograph of the paranasal incision.

Figure 5. Intraoperative microphotograph of paranasal surgical excision.

4. Discussion

4.1. Socio-Demographic Features

The relative frequency in our study over a 13-year period was 33.7%. This frequency is close to Amana *et al.* in TOGO 4.78% [1], with lower frequencies observed in Koffi-Aka *et al.* in Côte d'Ivoire 0.1% [3] and Kharoubi *et al.* in Morocco 1.2% [4]. The mean age was 43.76 years, with a median of 40 years and extremes from 22 to 84 years in our study, close to that of Amana *et al.* in Togo 36 years [1]. Among European authors, the average age is higher between 60 and 70 years [2]. There was no gender predominance: 13 men versus 12 women, giving a sex ratio of 1.08. However, most authors (Amana, Kharoubi, and Keita) describe a male predominance [1] [5] [6]. Housewives were the most common occupation (32%), followed by teachers (28%) and petroleum engineers (16%). The cabinetmaker profession accounted for 3 cases, or 4.05%, although the study by Keita *et al.* [6] reported only one case; indeed, the cabinetmaker profession was

occupationally exposed to wood dusts, which are risk factors reported in the literature.

4.2. Clinical Aspects

Nasosinus allergy accounted for 17% of cases, followed by chronic sinusitis (12%); however, in 49% of cases, the patient's history was not specified. There was no sexual predominance, the sex ratio being 1.08. Occupation, socio-economic level, and education had no impact on the development of these tumors.

Repeated personal history of allergy (17%) and chronic sinusitis (12%) were probably risk factors associated with the development of pseudo-inflammatory tumors. The delay in consultation was most often late, at 1 year (14 cases, 56%) or 6 months (10 cases), as reported by Kharoubi *et al.* [5] in Morocco.

Clinically, a complete nasosinus syndrome was found by most authors [1] [4] [6]. Facial swelling accounted for 22 cases (29%), although Amana *et al.* and Koffi-Aka *et al.* found 22.4% and 87% respectively.

The various phases of the physical examination (endobuccal tongue depressor, anterior rhinoscopy, otoscopy) are highly sensitive in evoking the clinical diagnosis, and must be carried out meticulously, especially in cases of palatal curvature (8 cases), unilateral endonasal mass (22 cases, 88%) and associated otitis (2 cases of seromucous otitis).

Complementary ophthalmological examination is an essential part of the physical examination, as it enables us to search for associated ophthalmic lesions (unilateral exophthalmos, with visual acuity, in 4 cases, 16%). This observation was made by Amana *et al.*, who reported orbital involvement (12%), with reduced visual acuity in 5.6% of cases.

4.3. Morphological Features

On imaging, CT was the gold standard, with hyperdense images found in 22 cases (88%). Histologically, benign nasosinusal tumors were represented by naso-sinusal polyps in 15 cases (60%), followed by pleiomorphic adenomas in 5 cases (20%) and 33 cases (12%). Our results are close to those of Amana *et al.*, Ette *et al.*, who found 66.2% and 60% respectively for benign tumors [1] [7]. Papilloma was the most common histological form in the Amana *et al.* series, accounting for 20.2% [1], compared with 16.6% in the Koffi-Aka series [4]. The results reported by some authors [3] [5] were low, at 19.70%.

4.4. Therapeutic Features and Evolutionary

Open surgery was our therapeutic strategy due to the weakness of the technical platform, and this is in line with the attitude of various sub-Saharan authors [1] [4] [6] [7].

5. Conclusion

Benign nasosinus tumors are dominated by nasosinus polyps. In our practice,

their relative frequency is estimated at around 30% of all tumors diagnosed over a period of more than ten years, with characteristics identical to those reported in the literature from sub-Saharan Africa. The complete nasosinus syndrome, together with rhinoscopy and CT scan data, constitutes a clinical criterion with a strong presumptive diagnosis; and the anatomopathological study of surgical specimens confirms the diagnosis with certainty. Management of these tumors is mainly surgical, with paralateronasal techniques predominating.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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