

Supplementary File

Tumor location and invasion pattern

Anatomical classification based on preoperative imaging and intraoperative findings revealed that the tumors were located primarily in the ethmoid sinus (6, 19.4%), frontal sinus (2, 6.5%), maxillary sinus (4, 12.9%), or multiple sites (18, 58.1%). No tumors were confined solely to the sphenoid sinus.

Regarding invasion patterns, bone destruction was observed in (16, 51.6%), direct invasion of adjacent tissues (17, 54.8%), and postoperative or congenital bony defects in (1, 3.2%) (Supplementary Table SI).

Supplementary Table SI. Tumor invasion site

Variable	Benign N=16	Malignant N=7	Inflammatory N=8	Total N=31	P value
Ethmoid sinus	5(31.3%)	1(14.3%)	0	6(19.4%)	0.175
Frontal sinus	1(6.3%)	0	1(12.5%)	2(6.5%)	0.616
Maxillary sinus	2(12.5%)	1(14.3%)	1(12.5%)	4(12.9%)	0.992
Sphenoid sinus	0	0	0	0	
Multiple sites	8(50%)	5(71.4%)	6(75%)	18(58.1%)	0.407
Destruction of bone	9(56.3%)	5(71.4%)	2(25%)	16(51.6%)	0.173
Postoperative destruction or congenital bone defects	1(6.3%)	0	0	1(3.2%)	0.616
Direct invasion	7(43.8%)	4(57.1%)	6(75%)	17(54.8%)	0.346

Note: * indicates $P < 0.05$, which is statistically significant.

Treatment modalities and surgical outcomes

Among the 31 cases, (27, 87.1%) underwent surgical resection. The treatment approaches included ophthalmic surgery (20, 64.5%), otolaryngology surgery (4, 12.9%), combined surgery (2, 6.4%), and neurosurgical intervention (1, 3.2%). (4, 12.9%) received medical therapy alone due to nonsurgical indications (Supplementary Table SII).

Supplementary Table SII. Treatment protocols

Variable	Benign N=16	Malignant N=7	Inflammatory N=8	Total N=31	P value
Drug therapy	1(6.3%)	1(14.3%)	2(25%)	4(12.9%)	0.413
Ophthalmic surgery	11(68.8%)	6(85.7%)	3(37.5%)	20(64.5%)	0.15
Otolaryngology surgery	2(12.5%)	0	2(25%)	4(12.9%)	0.42
Neurosurgery	1(6.3%)	0	0	1(3.2%)	<0.999
Combined surgery	1(6.3%)	0	1(12.5%)	2(6.4%)	<0.999

Note: * indicates $P < 0.05$, which is statistically significant.