

1 **Metastatic renal cell carcinoma presenting as a paranasal sinus mass:**
2 **the importance of differential diagnosis**

3

4 *Short title: Renal Cell Carcinoma and Paranasal Sinus Mass*

5

6

7 Ralli Massimo ^a, Altissimi Giancarlo ^b, Turchetta Rosaria ^b, Rigante Mario ^c

8

9 a) Department of Oral and Maxillofacial Sciences, Sapienza University of Rome, Italy.

10 b) Department of Otorhinolaryngology, Audiology and Ophthalmology, Sapienza University of
11 Rome, Italy.

12 c) Department of Otorhinolaryngology, Catholic University of Sacred Heart, Rome, Italy

13

14

15

16 **Corresponding Author:**

17 Massimo Ralli, MD, PhD

18 Address: Department of Oral and Maxillofacial Sciences, Sapienza University of
19 Rome. Viale del Policlinico 155, 00186, Rome Italy.

20 Email: massimo.ralli@uniroma1.it

21

22

23 **Conflicts of interest:** none

24 **Sources of Funding:** The Authors have not received financial support for this
25 research and work.

26 **Abstract**

27 Metastasis in the paranasal sinuses are rare; renal cell carcinoma is the most common
28 cancer that metastasize to this region. We present the case of a patient with a 4-month
29 history of a rapidly growing mass of the nasal pyramid following a nasal trauma,
30 associated to spontaneous epistaxis and multiple episodes of hematuria. Cranial CT
31 scan and MRI showed an ethmoid mass extending to the choanal region, the right
32 orbit, the right frontal sinus with an initial intracranial extension. Patient underwent
33 surgery with a trans sinusal frontal approach using a bicoronal incision combined with
34 an anterior midfacial degloving; histological exam was compatible with a metastasis
35 of clear cell renal carcinoma. Following histological findings, a total body CT scan
36 showed a solitary 6 cm mass in the upper posterior pole of the left kidney identified as
37 the primary tumor. Although rare, metastatic renal cell carcinoma should always be
38 suspected in patients with nasal or paranasal masses, especially if associated to
39 symptoms suggestive of a systemic involvement such as hematuria. A correct early-
40 stage diagnosis of metastatic RCC can considerably improve survival rate in these
41 patients; preoperative differential diagnosis with contrast-enhanced imaging is
42 fundamental for the correct treatment and follow up strategy.

43

44 **Introduction**

45 Renal cell carcinoma (RCC) is the most common kidney cancer, with approximately
46 35,000 new cases in the US each year [1]; RCC mainly affects male patients between
47 40 and 60 years old [2]. Common presentation symptoms include hematuria (40%),
48 flank pain (40%), and a palpable abdominal mass (25%) [3]. Approximately 30% of
49 patients with renal cell carcinoma present with methastatic disease [4]; target organs
50 are lung (75%), soft tissues (36%), bone (20%), liver (18%), cutaneous sites (8%) and
51 central nervous system (8%) [5, 6]. Metastasis in the paranasal sinuses are rare [7];
52 however, RCC is the most common cancer that metastasize to this region. Prognosis
53 of metastatic RCC is poor [8]; the survival rate ranges between 15-30% at 5 years [9]
54 in case of a single metastasis and between 0 and 7% in patients with multiple
55 metastases [10]. Metastatic RCC is often resistant to chemotherapy and radiotherapy
56 [11]; numerous agents targeting VEGF and non-VEGFR pathways have been
57 proposed during the last decade for the treatment of advanced RCC [12-18].

58 We present the case of a patient with a single, rapidly growing mass in the
59 upper portion of the nasal pyramid, with late, post nasal surgery histological diagnosis
60 of renal cell carcinoma that allowed primary tumor identification.

61

62 **Case Presentation**

63 A 72-year-old man was referred to our institution with a 4-month history of a
64 voluminous mass in the upper portion of the nasal pyramid following a nasal trauma.
65 He had been treated a few weeks earlier at a different ENT service for a massive
66 spontaneous epistaxis. The patient also reported a long history of hematuria,
67 previously attributed to renal tuberculosis occurred over 40 years before. At
68 admission, a cranial CT scan showed a large soft tissue ethmoid mass extending to the

69 right and left choanal region, the right orbit, the right frontal sinus and an initial
70 intracranial extension with partial erosion of the crista galli. MRI confirmed the
71 evidence found at computed tomography (*Fig. 1*). Fine needle aspiration showed
72 typical epithelial tissue and clear-cytoplasm cells interpreted as pericytes.
73 Preoperative local biopsy was not performed due to the history of severe epistaxis and
74 the high risk of massive bleeding during the procedure.

75 The patient underwent surgery with a trans sinusal frontal approach using a
76 bicoronal incision combined with an anterior midfacial degloving to excise the mass;
77 however, the right orbital and especially the initial intracranial extension did not allow
78 a complete removal of the neoplasm. Considerable bleeding occurred during surgery.
79 The histological exam revealed a clear cell renal carcinoma (*Fig. 2*). Based on these
80 findings, the patient underwent a total body CT scan that showed a solitary 6 cm mass
81 in the upper posterior pole of the left kidney. Bone scintigraphy also revealed
82 increased uptake in the ethmoid and orbital region. Due to the poor general
83 conditions, no surgery was performed to remove the primary tumor; the patient died 4
84 months later.

85

86 **Discussion**

87 Nasal cavity and paranasal sinus cancers are usually primary tumors. Metastasis to the
88 paranasal sinuses are rarely found; among them, renal cell carcinoma is the most
89 common cancer to metastasize to this region (49%) followed, respectively, by
90 bronchus, urogenital ridge, breast and gastrointestinal tract. [19,20]. RCC can
91 metastasize to any region of the body, with a prevalence for lungs (75% of cases),
92 regional lymph nodes (65%), bone (40%), and liver (40%) [21]. Metastasis to the
93 head and neck regions account for about 15% of the cases, targeting in order of

94 frequency the paranasal sinuses, the larynx, jaws, temporal bones, thyroid and parotid
95 glands [22].

96 RCC tumor cells can reach the sinonasal region via two routes: the first
97 includes inferior vena cava, lungs, heart and the maxillary artery; the second involves
98 the communication of the avascular vertebral venous plexus and the intracranial
99 venous plexus [23]. Maxillary sinuses are the most commonly involved sinuses by
100 metastatic tumors (36%), followed by the ethmoid (25%), frontal and sphenoid
101 sinuses (17%) and nasal cavity (11%) [24,25]. One of the first reports available in
102 recent literature to describe a renal clear cell carcinoma metastatic to the paranasal
103 sinuses has been published by Matsumoto in 1982 [26]; afterwards several Authors
104 described case reports of RCC presenting as metastatic diseases in the paranasal
105 sinuses. Available literature describes presentation of RCC metastasis as a solitary
106 periorbital [27] and orbital mass [28], as a frontal sinus mass [29], as an ethmoid sinus
107 mass [30,31], in the nasal cavity [32-33], in the maxillary [34,35] and sphenoid sinus
108 [36-38]. In some cases, the extension of the metastasis to the skull base has been
109 described [39].

110 Metastatic RCC to the sinonasal district has been reported as the presenting
111 sign of this disease in a few cases [29,34], while in others followed or occurred
112 simultaneously to primary cancer diagnosis. Presentation symptoms are often limited
113 to recurrent epistaxis [40-43] and the presence of a primary renal cell carcinoma is
114 recognized only after surgical removal of the metastatic tumor via histologic
115 examination supported by immunohistochemical staining of the specimen [5]. Rarely,
116 metastasis in the sinonasal cavities followed RCC diagnosis and treatment [44-46];
117 cases of post surgery metastasis in the head and neck district have been described up
118 to 12 years after surgery [47].

119 The key point in RCC presenting with a sinonasal metastasis is differential
120 diagnosis with primary tumors such as adenocarcinomas, angiofibromas,
121 hemangiopericytomas, melanomas, hemangiomas, metastatic tumors from the breast
122 and lungs and, more rarely, systemic diseases such as Wegener's and midline
123 granulomas [48]. In fact, in such cases diagnostic delays, misdiagnosis,
124 undertreatment and mismanagement could occur due to 1) the attribution of the mass
125 to a primary sinonasal cancer given the rare nature of sinonasal metastasis, or 2) to the
126 overlook of presenting symptoms such as recurrent epistaxis, swelling, pain and nasal
127 obstruction. Haematuria can be considered as an indicator of RCC; it has been
128 reported that about 10% of patients with RCC with distant metastasis exhibit massive
129 haematuria. However, intermittent haematuria may be present in 90% of cases [3].
130 For this reason, patients presenting with nasosinusal tumors also reporting hematuria
131 should always undergo systemic evaluation. Radiological examination with CT scan
132 and, secondly, MRI and angiography are necessary in assessing the extent of the
133 metastatic lesion. However, it should be considered that RCC metastasis have similar
134 radiological appearances to primary malignant lesions of sinunasal cavities; some
135 indicators of renal origin at CT scan are enhancement, destruction, and lack of
136 tumoral calcification [6].

137 In this case, CT scan allowed the identification of a neoformed paranasal sinus
138 mass; however, only histological exam identified the mass as a metastasis of RCC and
139 led to the execution of total body CT scan to identify primary tumor. Although
140 difficult, differential preoperative diagnosis is fundamental for the correct treatment
141 and follow up strategy; contrast-enhanced imaging plays a central role since a
142 preoperative biopsy of the nasal mass may be difficult in these patients due to massive
143 recurring bleeding and, in some cases, may result in only necrotic tissue inconclusive

144 on histopathology [42]. The ENT specialist, therefore, should always suspect
145 metastatic disease from primary sites external to the head and neck region in patients
146 with hypervascular mass in the nasal cavity or paranasal sinuses and a history of
147 massive nasal bleeding and should complete preoperative workup with total-body CT
148 scan. Furthermore, it is important to remark that metastatic tumours originating from
149 primary kidney masses are highly vascularized and surgeons should expect significant
150 haemorrhage during surgical removal. One of the main advantages of a preoperative
151 diagnosis of RCC when approaching a patient with sinonasal mass is the preparation
152 for management of severe perioperative bleeding, thus implementing strategies to
153 optimise the patient's tolerance to bleeding and to reduce the amount of bleeding
154 morbidity and mortality.

155 Prognosis of metastatic RCC is poor; however, a correct early-stage diagnosis
156 of metastatic disease can considerably improve survival rate: literature reports that
157 excision of solitary metastatic lesion of renal cell carcinoma following nephrectomy
158 results in a 41% survival at 2 years and 13% survival at 5 years [48]. The sole
159 excision of the metastatic lesion, instead, significantly lowers survival rate [49];
160 patients with multiple metastases have a 5 year survival rate between 0 and 7% [10].

161 Although metastatic RCC is often resistant to chemotherapy and radiotherapy,
162 numerous agents targeting VEGF and non-VEGFR pathways should be taken into
163 account for the treatment of advanced RCC. Multitargeted VEGF tyrosine kinase
164 inhibitors (TKIs) include sorafenib [12], sunitinib [13], pazopanib [14] and axitinib
165 [15], bevacizumab [16]; mTOR inhibitors include temsirolimus [17] and everolimus
166 [18]. Unfortunately, especially in cases of advanced neoplasms, benefits are still time-
167 limited and treatment decisions should be based not only on guidelines but also on
168 clinical considerations, such as patient comorbidities, treatment toxicity, prognostic

169 factors and molecular aspects of disease. In this case, the poor general conditions of
170 the patient prevented additional treatment except for palliative pain management.

171 In conclusion, metastatic renal cell carcinoma should always be suspected in
172 patients with nasal or paranasal masses, especially if associated to symptoms
173 suggestive of a systemic involvement such as hematuria; early-stage diagnosis of
174 metastatic disease can considerably limit perioperative complications and improve
175 survival rate.

176

177 **References**

- 178 1. Jemal A, Tiwari RC, Murray T, et al. Cancer statistics, 2004. *CA Cancer J Clin*
179 2004; 54: 8–29
- 180 2. Lim R. Y., Bastug D.F., Caldwell B.L. Metastatic renal cell carcinoma of the
181 nasal septum. *WV Med J*. 1989. 85: 143-145.
- 182 3. Skinner DG, Vermillion CD, Pfister RC, Leadbetter WF. Renal cell
183 carcinoma. *Am Fam Physician*. 1971;4:89–94
- 184 4. Flamigan RC, Campbell SC, Clark JI, Picken MM. Metastatic renal cell
185 carcinoma. *Curr Treat Options Oncol*. 2003;4:385–390.
- 186 5. Singh J, Baheti V, Yadav SS, Mathur R. Occult renal cell carcinoma
187 manifesting as nasal mass and epistaxis. *Rev Urol*. 2014;16(3):145-8.
- 188 6. Som PM, Norton KI, Shugar JM, et al: Metastatic hypernephroma to the head
189 and neck. *AJNR Am J Neuroradiol* 8:1103–1106, 1987.
- 190 7. Ziari M, Shen S, Amato RJ, Teh BS. Metastatic renal cell carcinoma to the
191 nose and ethmoid sinus. *Urology*. 2006 Jan;67(1):199.
- 192 8. Ather MH, Masood N, Siddiqui T. Current management of advanced and
193 metastatic renal cell carcinoma. *Urol J*. 2010;7:1-9.
- 194 9. Torres Muros B, Bonilla Parrilla R, Solano Romero JR, Rodríguez Baró JG,
195 Verge González J. Metastasis in maxilar sinus as only manifestation of
196 disseminate renal adenocarcinoma. *An Otorrinolaringol Ibero Am*.
197 2007;34(3):231-6.
- 198 10. Cheng ET, Greene D, Koch RJ. Metastatic renal cell carcinoma to the nose.
199 *Otolaryngol Head Neck Surg* 2000;122:464.
- 200 11. Motzer RJ, Russo P, Nanus DM, Berg WJ. Renal cell carcinoma. *Cur Probl*
201 *Cancer* 1997;21:185–232.

- 202 12. Escudier B, Lassau N, Angevin E, Soria JC, Chami L, Lamuraglia M,
203 Zafarana E, Landreau V, Schwartz B, Brendel E, Armand JP, Robert C. Phase
204 I trial of sorafenib in combination with IFN alpha-2a in patients with
205 unresectable and/or metastatic renal cell carcinoma or malignant melanoma.
206 Clin Cancer Res. 2007 Mar 15;13(6):1801-9.
- 207 13. Motzer RJ, Michaelson MD, Rosenberg J, Bukowski RM, Curti BD, George
208 DJ, Hudes GR, Redman BG, Margolin KA, Wilding G. Sunitinib efficacy
209 against advanced renal cell carcinoma. J Urol. 2007 Nov;178(5):1883-7.
- 210 14. Sternberg CN, Davis ID, Mardiak J, Szczylik C, Lee E, Wagstaff J, Barrios
211 CH, Salman P, Gladkov OA, Kavina A, Zarbá JJ, Chen M, McCann L, Pandite
212 L, Roychowdhury DF, Hawkins RE. Pazopanib in locally advanced or
213 metastatic renal cell carcinoma: results of a randomized phase III trial. J Clin
214 Oncol. 2010 Feb 20;28(6):1061-8.
- 215 15. Rini BI, Melichar B, Ueda T, Grünwald V, Fishman MN, Arranz JA, Bair AH,
216 Pithavala YK, Andrews GI, Pavlov D, Kim S, Jonasch E. Axitinib with or
217 without dose titration for first-line metastatic renal-cell carcinoma: a
218 randomised double-blind phase 2 trial. Lancet Oncol. 2013 Nov;14(12):1233-
219 42.
- 220 16. Escudier B, Pluzanska A, Koralewski P, Ravaud A, Bracarda S, Szczylik C,
221 Chevreau C, Filipek M, Melichar B, Bajetta E, Gorbunova V, Bay JO,
222 Bodrogi I, Jagiello-Gruszfeld A, Moore N; AVOREN Trial investigators..
223 Bevacizumab plus interferon alfa-2a for treatment of metastatic renal cell
224 carcinoma: a randomised, double-blind phase III trial. Lancet. 2007 Dec
225 22;370(9605):2103-11.

- 226 17. Hudes G, Carducci M, Tomczak P, Dutcher J, Figlin R, Kapoor A,
227 Staroslawska E, Sosman J, McDermott D, Bodrogi I, Kovacevic Z, Lesovoy
228 V, Schmidt-Wolf IG, Barbarash O, Gokmen E, O'Toole T, Lustgarten S,
229 Moore L, Motzer RJ; Global ARCC Trial.. Temsirolimus, interferon alfa, or
230 both for advanced renal-cell carcinoma. *N Engl J Med.* 2007 May
231 31;356(22):2271-81.
- 232 18. Motzer RJ, Escudier B, Oudard S, Hutson TE, Porta C, Bracarda S, Grünwald
233 V, Thompson JA, Figlin RA, Hollaender N, Urbanowitz G, Berg WJ, Kay A,
234 Lebwohl D, Ravaud A; RECORD-1 Study Group.. Efficacy of everolimus in
235 advanced renal cell carcinoma: a double-blind, randomised, placebo-controlled
236 phase III trial. *Lancet.* 2008 Aug 9;372(9637):449-56.
- 237 19. Sountoulides P, Metaxa L, Cindolo L. Atypical presentations and rare
238 metastatic sites of renal cell carcinoma: a review of case reports. *J Med Case*
239 *Rep.* 2011;5:429.
- 240 20. Evgeniou E, Menon KR, Jones GL, Whittet H, Williams W. Renal cell
241 carcinoma metastasis to the paranasal sinuses and orbit. *BMJ Case Rep.* 2012
242 Mar 27;2012. pii: bcr0120125492.
- 243 21. Lang EE, Patil N, Walsh RM, Leader M, Walsh MA. A case of renal cell
244 carcinoma metastatic to the nose and tongue. *Ear Nose Throat J* 2003;82:382–
245 3.
- 246 22. Dinçbas FO, Atalar B, Oksüz DC, Aker FV, Koca S. Unusual metastasis of
247 renal cell carcinoma to the nasal cavity. *J Buon.* 2004 Apr-Jun;9(2):201-4.
- 248 23. Gottlieb MD, Roland JT Jr. Paradoxical spread of renal cell carcinoma to the
249 head and neck. *Laryngoscope.* 1998;108:1301–1305

- 250 24. Kovačić M, Krvavica A, Rudić M. Renal cell carcinoma metastasis to the
251 sinonasal cavity: case report. *Acta Clin Croat.* 2015 Jun;54(2):223-6.
- 252 25. Bernstein J.M., Montgomery W. Bologh K. (1966) Metastatic tumors to the
253 maxilla, nose and paranasal sinuses. *Laryngoscope* 76: 621-650.
- 254 26. Matsumoto Y, Yanagihara N. Renal clear cell carcinoma metastatic to the nose
255 and paranasal sinuses. *Laryngoscope.* 1982 Oct;92(10 Pt 1):1190-3.
- 256 27. Homer JJ, Jones NS. Renal cell carcinoma presenting as a solitary paranasal
257 sinus metastasis. *J Laryngol Otol.* 1995 Oct;109(10):986-9.
- 258 28. Jung JW, Yoon SC, Han DH, Chi M. Metastatic renal cell carcinoma to the
259 orbit and the ethmoid sinus. *J Craniofac Surg.* 2012 Mar;23(2):e136-8.
- 260 29. Ikeuchi T, Asai N, Hori T, Hirao N, Tozawa K, Yamada Y, Kori K. Renal cell
261 carcinoma detected by metastasis to the frontal sinus: a case report. *Hinyokika*
262 *Kiyo.* 1998 Feb;44(2):89-92.
- 263 30. Maheshwari GK, Baboo HA, Patel MH, Usha G. Metastatic renal cell
264 carcinoma involving ethmoid sinus at presentation. *J Postgrad Med.* 2003 Jan-
265 Mar;49(1):96-7.
- 266 31. Terada N, Hiruma K, Suzuki M, Numata T, Konno A. Metastasis of renal cell
267 cancer to the ethmoid sinus. *Acta Otolaryngol Suppl.* 1998;537:82-6.
- 268 32. Vreugde S, Duttman R, Halama A, Deron P. Metastasis of a renal cell
269 carcinoma to the nose and paranasal sinuses. *Acta Otorhinolaryngol Belg.*
270 1999;53(2):129-31.
- 271 33. Nason R, Carrau RL. Metastatic renal cell carcinoma to the nasal cavity. *Am J*
272 *Otolaryngol.* 2004 Jan-Feb;25(1):54-7.

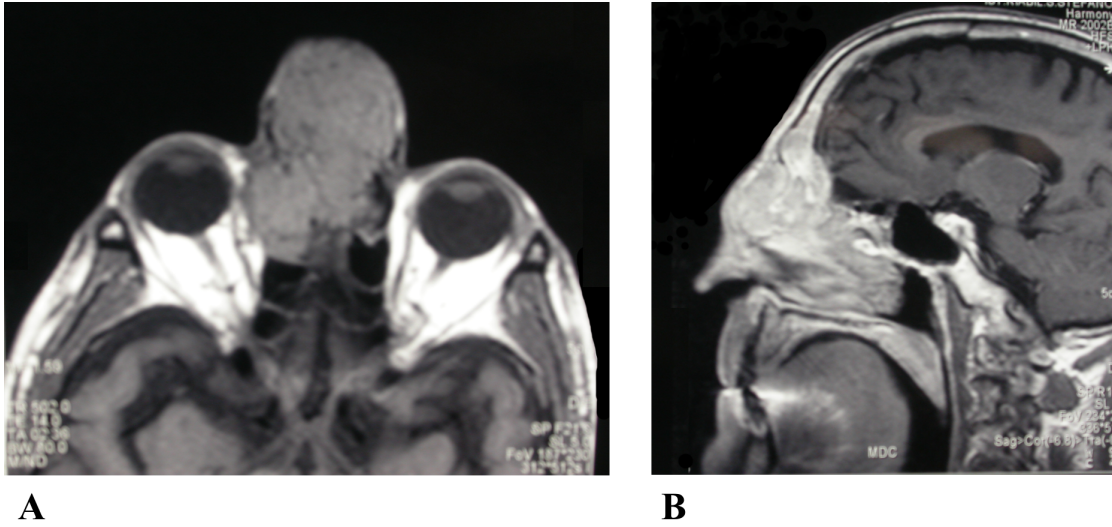
- 273 34. Torres Muros B, Solano Romero JR, Baró Rodríguez JG, Bonilla Parrilla R.
274 Maxillary sinus metastasis of renal cell carcinoma. *Actas Urol Esp.* 2006
275 Oct;30(9):954-7.
- 276 35. He YF, Chen J, Xu WQ, Ji CS, Du JP, Luo HQ, Hu B. Case report. Metastatic
277 renal cell carcinoma to the left maxillary sinus. *Genet Mol Res.* 2014 Sep
278 12;13(3):7465-9. doi: 10.4238/2014.September.12.12.
- 279 36. Koscielny S. The paranasal sinuses as metastatic site of renal cell carcinoma.
280 *Laryngorhinootologie.* 1999 Aug;78(8):441-4.
- 281 37. Simo R, Sykes AJ, Hargreaves SP, Axon PR, Birzgalis AR, Slevin NJ,
282 Farrington WT. Metastatic renal cell carcinoma to the nose and paranasal
283 sinuses. *Head Neck.* 2000 Oct;22(7):722-7.
- 284 38. Pereira Arias JG, Ullate Jaime V, Valcárcel Martín F, Onaniel Pérez VJ,
285 Gutiérrez Díez JM, Ateca Díaz-Obregón R, Berreteaga Gallastegui JR.
286 Epistaxis as initial manifestation of disseminated renal adenocarcinoma. *Actas*
287 *Urol Esp.* 2002 May;26(5):361-5.
- 288 39. Parida PK. Renal cell carcinoma metastatic to the sinonasal region: Three case
289 reports with a review of the literature. *Ear Nose Throat J.* 2012
290 Nov;91(11):E11-6.
- 291 40. Szymański M, Szymańska A, Morshed K, Siwiec H. Renal cell carcinoma
292 metastases to nose and paranasal sinuses presenting as recurrent epistaxis.
293 *Wiad Lek.* 2004;57(1-2):94-6.
- 294 41. Lee HM, Kang HJ, Lee SH. Metastatic renal cell carcinoma presenting as
295 epistaxis. *Eur Arch Otorhinolaryngol.* 2005 Jan;262(1):69-71. Epub 2004 Feb
296 19.

- 297 42. Nayak DR, Pujary K, Ramnani S, Shetty C, Parul P. Metastatic renal cell
298 carcinoma presenting with epistaxis. *Indian J Otolaryngol Head Neck Surg.*
299 2006 Oct;58(4):406-8.
- 300 43. Kumar R, Sikka K, Kumar R, Chatterjee P. Nephrogenic epistaxis. *Singapore*
301 *Med J.* 2014 Jul;55(7):e112-3.
- 302 44. Montoro Martínez V, López Vilas M, Gurri Freixa M, De Dios Orán E,
303 Montserrat Gili JR, Fabra Llopis JM. Nasal sinus metastasis of renal
304 carcinoma. A case report. *Acta Otorrinolaringol Esp.* 1999 Nov-
305 Dec;50(8):653-6.
- 306 45. Sawazaki H, Segawa T, Yoshida K, Kawahara T, Inoue T, Soda T, Kanba T,
307 Yoshimura K, Takahashi T, Nakamura E, Nishiyama H, Ito N, Kamoto T,
308 Ogawa O. Bilateral maxillary sinus metastasis of renal cell carcinoma: a case
309 report. *Hinyokika Kyo.* 2007 Apr;53(4):231-4.
- 310 46. Hong SL, Jung DW, Roh HJ, Cho KS. Metastatic renal cell carcinoma of the
311 posterior nasal septum as the first presentation 10 years after nephrectomy. *J*
312 *Oral Maxillofac Surg.* 2013 Oct;71(10):1813.e1-7.
- 313 47. Fyrmpas G, Adeniyi A, Baer S. Occult renal cell carcinoma manifesting with
314 epistaxis in a woman: a case report. *J Med Case Rep.* 2011;5:79.
- 315 48. Dineen MK, Pastore RD, Emrich LJ, Huben RP. Results of surgical treatment
316 of renal cell carcinoma with solitary metastasis. *J Urol* 1988;140:277-279
- 317 49. Skinner DG, Colvin RB, Vermillion CD, Pfister RC, Leadbetter WF.
318 Diagnosis and management of renal cell carcinoma. A clinical and pathologic
319 study of 309 cases. *Cancer* 1971;28:1165-1177.
- 320

321 **Figures**

322

323



324

325 *Fig. 1: MRI in the axial (A) and sagittal (B) planes showing a soft tissue ethmoid mass*
326 *extending to the right and left choanal region, the right orbit, the right frontal sinus*
327 *and an initial intracranial extension with partial erosion of the crista galli.*

328



329

330 *Fig 2: the excised mass; histological exam was consistent with a clear cell renal*
331 *carcinoma.*