CASE REPORT

CT findings in two cases of lobular capillary haemangioma of the nasal cavity: focusing on the enhancement pattern

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Lobular capillary haemangioma, known as pyogenic granuloma, is a relatively common benign vascular neoplasm that is composed of hyperplastic clusters of capillaries arranged in a lobular architectural pattern. Most mucosal lobular capillary haemangioma (LCH) of the head and neck arise in the oral cavity, but the nasal cavity involvement is rare. We report here on the CT imaging findings of two cases of LCH involving the nasal cavity, with an emphasis being placed on the different pattern of enhancement of the tumour on the enhanced CT scans.

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Introduction

Lobular capillary haemangioma (LCH) is also known as pyogenic granuloma and is a relatively common benign vascular neoplasm composed of hyperplastic clusters of capillaries arranged in a lobular architectural pattern.^{1,2} Most mucosal LCHs of the head and neck arise in the oral cavity, but nasal cavity involvement is rare.^{3–8} Making the correct pre-operative diagnosis of this entity when it occurs in the nasal cavity may be difficult because of the unusual location for this tumour and the overlapping of symptoms with those of chronic sinusitis. There have been several sporadic reports in English-language medical literature that have included the CT imaging findings of LCH involving the nasal cavity.^{3–8} Although the clinical, histopathological and pre-contrast CT features have been well described in these reports, only limited descriptions of the enhanced CT imaging findings have been reported in only a few case reports.^{5,8}

We report here on the CT imaging findings of two cases of LCH involving the nasal cavity, with an emphasis being placed on the different pattern of enhancement of the tumour on the enhanced CT scans.

Case reports

Case 1

A 64-year-old male presented with an 8-month history of right-sided nasal obstruction accompanied by unilateral rhinorrhoea and repeated epistaxis. He had no history of trauma or nasal packing. On the physical examination, the right nasal cavity was obstructed by a large polypoid mass.

CT examination of the paranasal sinuses and nasal cavity was performed on a 4 channel multidetector row CT scanner (LightSpeed Plus; GE Healthcare, Waukesha, WI). The enhanced scans were obtained immediately after intravenous administration of 100 ml of contrast media (iopromide, Ultravist 300; Schering, Seoul, Republic of Korea) at a rate of 1.8 ml s⁻¹. No delayed imaging was performed. Images were obtained in both the axial and coronal planes. The CT scans demonstrated a 2.4 × 2.0 × 1.6 cm well-defined, expansile mass in the right nasal cavity, which extended to the ethmoid sinus. The mass caused pressure remodelling of the adjacent bones without evidence of frank destruction or orbital/intracranial invasion. On the pre-contrast CT scans, the mass was isodense compared with muscle, without evidence of intralesional calcification (Figure 1a,b). After contrast enhancement, the lesion demonstrated marked central enhancement of the mass with a peripheral isodense area (Figure 1c,d).

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Figure 1 The pre-contrast (a) axial and (b) coronal CT scans show a well-defined, expansile mass (star) in the right nasal cavity and the mass extends into the ethmoid sinus. The mass caused pressure remodelling of the adjacent bones without evidence of frank destruction or orbital/intracranial invasion. There is no intralesional calcification. The post-contrast (c) axial and (d) coronal CT scans show marked central enhancement of the mass (star) with a peripheral isodense area. (e) The photomicrograph of the specimen shows that the tumour is composed of lobulated capillaries lined by prominent endothelial cells (arrows) (haematoxylin–eosin stain; original magnification $\times 100$)

The nasal mass was completely excised under general anaesthesia using an endoscopic surgical technique. The microscopic examination of the excised specimens showed a diffuse proliferation of angiomatous lobules that contained prominent capillaries lined by prominent endothelial cells. The microscopic findings of the pathologic specimen were consistent with the diagnosis of lobular capillary haemangioma (Figure 1e).

Case 2

A 56-year-old male presented with a 3-month history of intermittent epistaxis. He had no history of trauma or nasal packing. The physical examination revealed a polypoid mass originating from the floor of the right nasal cavity.

CT examination of the paranasal sinuses and nasal cavity was performed on a four-channel multidetector CT scanner. A pre-contrast CT scan demonstrated about $1.6 \times 1.3 \times 1.3$ cm well-defined soft-tissue mass without evidence of intralesional calcification in the floor of the right nasal cavity (Figure 2a,b). There was no evidence of bony destruction or extension to the paranasal sinuses. After contrast enhancement, the lesion demonstrated mild diffuse homogeneous enhancement

of the mass without a central strong enhanced portion (Figure 2c,d).

The nasal mass was completely excised under general anaesthesia using an endoscopic surgical technique. The microscopic examination of the excised specimens showed that the tumour was composed of lobulated capillaries lined by endothelial cells and the capillaries were supported by fibrous stroma. There was a heavy inflammatory cell infiltration. The microscopic findings of the pathological specimen were consistent with the diagnosis of lobular capillary haemangioma (Figure 2e).

Discussion

LCH is also known as pyogenic granuloma and this is a common benign lesion that is composed of hyperplastic clusters of capillaries arranged in a lobular architectural pattern.^{1,2} The name “pyogenic granuloma” is not correct for LCH because the condition is not associated with pyogenic infection and it does not histologically represent a granulomatous inflammation. Therefore, the term “lobular capillary haemangioma” was suggested to better describe the characteristic histological

Figure 2 The precontrast (a) axial and (b) coronal CT scans show a well-defined soft-tissue mass (arrows) without evidence of intralesional calcification in the floor of the right nasal cavity. The post-contrast (c) axial and (d) coronal CT scans show mild diffuse homogeneous enhancement of the mass (arrows) without a central strong enhanced portion. (e) The photomicrograph shows that the tumour is composed of lobulated capillaries lined by prominent endothelial cells (arrows). There is a heavy inflammatory cell infiltration (open arrows) (haematoxylin-eosin stain; original magnification $\times 100$)

features of this lesion.¹ Although the aetiology of LCH has not been clearly identified, microtrauma and female hormonal factors have been suggested as predisposing factors of LCH because these lesions usually occur after trauma or during pregnancy.³⁻⁸ Further, a few cases of pyogenic granuloma as a complication of nasal packing have been reported in the literature.^{6,7} Our patients did not have any clinical or laboratory evidence of these conditions.

This tumour occurs at all ages, but it is more frequently seen in middle-aged adults, and is more commonly seen in females than in males.^{3,5} On the other hand, LCH affects males more than females in the paediatric age group.³ It commonly arises from epithelium-lined tissue such as the cutaneous or mucosal surface of the head, neck and upper extremities. The most common sites of mucosal LCH of the

head and neck are the gingiva, lips, tongue and buccal mucosa, but involvement of the nasal cavity is rare.³⁻⁸ When it is seen in the nasal cavity, the anterior portion of the septal mucosa and the tip of the inferior turbinate are the most commonly involved areas.^{3,5,7,8}

The clinical manifestations of LCH of the nasal cavity depend on the size and location of the lesion. The most common presenting symptoms include nasal obstruction and recurrent unilateral epistaxis.³⁻⁸ Occasionally, nasal discharge and epiphora may also be present. In most cases, the diameter of the tumour ranges from several millimetres to several centimetres. To date, there have been no reported cases of malignant transformation.³ Regardless of the size, the tumours in our cases had common clinical characteristics: the patients' chief symptoms were persistent epistaxis and nasal obstruction. The current treatment of choice for

LCH is complete surgical excision of the lesion.^{3–7} If the lesion is confined to the nasal cavity, then endoscopic surgery may be considered as the ideal approach not only for small lesions, but also for large lesions that fill the entire nasal cavity. Recurrence after total excision is uncommon.^{3,6,7}

Histopathologically, LCH is a well-circumscribed round mass that is composed of lobulated capillaries surrounded by a fibromyxoid stroma, and these lobulated capillaries are separated by fibrous septae. The lobulated architecture that is most easily seen at low power is the hallmark of these lesions. The capillaries are lined by flattened or rounded endothelial cells. The capillaries vary from being tightly packed with scant lumens to larger dilated vascular spaces.^{1–8} Histologically, LCH is made up of two main areas: a lobular and a superficial ulcerative area. The lobular area shows a capillary proliferation with a microscopically distinct lobular architecture, and the superficial ulcerative area shows superficial neutrophilic infiltrates and irregular dilatation of blood vessels.^{5,9}

There have been several sporadic reports in the English-language medical literature that have included the CT imaging findings of LCH involving the nasal cavity.^{3–8} In these reports, the pre-contrast CT findings of LCH were described as a well-defined soft-tissue density mass in the nasal cavity, which is a non-specific finding. Puxeddu *et al*⁵ reported on six cases with performing contrast-enhanced CT imaging studies, and the reported findings were soft-tissue density masses with bright contrast enhancement. Lee *et al*⁸ reported the CT features of six cases of LCH in the nasal cavity, and the reported findings were an intensely enhancing mass and an iso- or hypoattenuating cap of variable thickness around the intensely enhancing mass in 5 (83.3%) of 6 patients. In the remaining patient (16.7%), the LCH lesion consisted of a lobular, intensely enhancing mass and a hypoattenuating area containing linear and spotty enhancing foci. However, in our two cases, the degree of enhancement of the tumours varied on the CT scans. In Case 1, which involved LCH in the nasal cavity, the contrast-enhanced CT imaging findings were similar to those of Lee *et al*'s⁸ previous report. Lee *et al*⁸ retrospectively speculated that the intensely enhancing mass on the enhanced CT scans corresponded histologically to a lobular area, and the

iso- or hypoattenuating cap of variable thickness might correspond to the superficial ulcerative areas. On the other hand, the contrast-enhanced CT scans in Case 2 showed mild diffuse homogeneous enhancement of the mass without a central strong enhanced portion or a hypoattenuating area containing linear and spotty enhancing foci. We believe that the degree of enhancement of the tumour on the CT scans is variable, probably owing to the variable size of both the tumour and capillaries.

On the basis of the CT imaging findings, the list for the differential diagnoses of LCH in the nasal cavity includes a number of benign and malignant hypervascularized masses, such as angiofibroma, angiomatous polyp, inverted papilloma, haemangioma, schwannoma, paraganglioma, lymphoma, angiosarcoma, haemangio-pericytoma and highly vascularized metastases (*i.e.* from kidney, thyroid, lung or breast).^{4–6} In addition, inflammatory processes such as sarcoid or Wegener's granulomatosis must be considered.^{4,6} None of these lesions have been reported in the literature to have a peripheral isodense area around marked central enhancement of the mass.⁸ In our cases, the contrast-enhanced CT imaging findings in Case 1 may help to suggest a diagnosis of LCH, although the contrast-enhanced CT findings in Case 2 are not specific for LCH. In the previously reported cases^{3–8} and our two cases, no internal calcification within the intranasal LCH lesions was present. Thus, this finding on CT scanning helped to exclude ossifying fibroma, chondro-osseous respiratory adenomatoid hamartoma and chondroid tumour. It is difficult to diagnose LCH involving the nasal cavity by imaging alone, but one may suspect the diagnosis of LCH in the case of a well-defined, intranasal mass with a history of intermittent epistaxis.

Even though the CT imaging findings of LCH are non-specific, LCH should be considered as a possible diagnosis when a well-defined soft-tissue mass with mild diffuse homogeneous enhancement or marked central enhancement of the mass with a peripheral isodense area on the enhanced CT scans is seen in the nasal cavity, especially if this tumour is an intranasal mass with a history of intermittent epistaxis. The reported imaging findings of this uncommon tumour will provide clinicians with useful information and facilitate management.

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