CLINICAL REPORT

Ganglion cyst of the carpal navicular. A case report and review of the literature

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Summary
Intraosseous ganglion (IOG) cyst of the scaphoid is an infrequent cause of hand and wrist pain. Intraosseous ganglia located in the scaphoid have rarely been described in the literature. We report the case of a 30-year-old right-handed woman who presented with a more than 24-month history of progressive right-wrist pain. No history of trauma was reported. Conservative treatment with anti-inflammatory medications before referral was unsuccessful. Examination revealed a small palpable mass in the carpal navicular region with no limitation of normal wrist motion. An IOG cyst of the scaphoid was found on standard radiograph and CT-scan of the wrist. Treatment consisted in curettage of the cyst followed by packing of the defect with autologous cancellous bone graft harvested in the distal end of the radial metaphysis. Satisfactory functional recovery was achieved. The clinical, radiographic and therapeutic aspects of this rare condition are discussed by the authors.

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Introduction
Diagnosis of intraosseous ganglion (IOG) cysts is established according to specific radiographic findings and histological examination suggestive of an intraosseous synovial proliferation [1]. These lesions, when located in the scaphoid, are infrequent causes of hand and wrist pain [1—12]. Isolated cases of ganglion cysts, mostly occurring in the lunate and scaphoid, have been reported. We report a case of IOG cyst of the scaphoid carpal bone.

Case report
Mrs R.T., 30 years old, right-handed, beautician, presented with a 2-year history of progressive right-wrist pain. During that period, the patient had received multiple symptomatic treatments associating antalgic, non-steroidal anti-inflammatory drugs combined with periodical wrist immobilization but no improvement was observed. Symptomatology became permanent the last 2 months. Clinical examination revealed a moderate swelling over the mid section of the palmar face and pain through extreme ranges of motion of the wrist. Wrist motion was not limited. Blood examination was unremarkable. Radiographic studies of the right wrist revealed a round-shaped defect of the proximal part of the scaphoid (Fig. 1). This lesion
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was solitary, well-defined, with a thin sclerotic margin and no cortical defect. The adjacent joints were normal. Computed tomography revealed a lucent area within the scaphoid with communication between the cystic lesion and the adjacent joints. Other carpal bones were normal in shape and of homogeneous density (Fig. 2). The patient underwent surgery through an anterior approach of the scaphoid bone combined with arthrotomy and lesion localization was performed using a wire under image intensifier. The cyst was visible through bone trephination and was of gelatinous and typical yellowish appearance. Thorough intralesional curettage of the scaphoid cavity followed by packing of the defect with cancellous bone graft harvested from the distal aspect of the radial metaphysis were performed. The bacteriological analysis for specific and common germs was negative. The content of the cyst was described anatomopathologically as a cystic formation with walls constituted by flattened, synovial-like, fibroconnective tissue cells with no true epithelial lining. Neither mucoid nor myxoid degeneration was observed. A removable splint was applied for 3 weeks for wrist immobilization. At 4-year follow-up, pain had disappeared and the wrist demonstrated stable normal mobility (Fig. 3). Standard radiograph showed complete resection of the cyst with satisfactory osseo-integration of the graft (Fig. 4).
Figure 4  Standard radiograph at 4-year follow-up demonstrating good integration of the bone graft with no recurrence.

Discussion

IOG cysts have been rarely reported. In most series, intraosseous ganglia have been reported to be located in the lower limb, and mainly occur in the epiphysometaphyseal part of the femur and tibia.

Pathogenesis of IOG cysts still remains controversial. There are two opposing theories: the idiopathic or primary intraosseous lesion is due to an intramedullary metaplasia of mesenchymal cells into synovial-like cells or ischemic bone necrosis resulting from mechanical stress or repeated micro-traumatisms. Resorption of necrotic material will give the place to an intraosseous cyst [6,13].

The second theory is based on the concept of cortical penetration of previously existing soft tissue ganglion [13]. IOG cyst might be completely asymptomatic or revealed through usually moderate pain unsuccessfully treated with analgesic medications. These pains could result from intraosseous hyperpressure secondary to pathologic process development within an inextensible limited cavity.

Other clinical manifestations might be observed and correlated with IOG cyst complications [1,2,6]:

- wrist swelling secondary to the rupture of the IOG cyst and the spreading of its content into the joint space [2];
- pathologic fracture [1] leading to increased pain.

Standard radiograph reveals an eccentric, uni- or multilobulated osteolytic lesion of a few millimetres in diameter, surrounded by a peripheral osteosclerosis. Cortical bone might be intact, thinner or even absent in sub-periosteal forms [14].

Computed tomography scan provides details of the spatial orientation of the lesion, confirms its liquid aspect and is helpful in detecting any cortical defect or articular communication which is pathognomonic [15]. This could have a therapeutic involvement specifically in the selection of the surgical approach.

Differential diagnosis includes:

- osteoid osteoma which pain is more significant and successfully treated with aspirin. The nidus has a characteristic appearance on CT scan;
- enchondroma or intraosseous chondroma, often asymptomatic of similar radiographic appearance than IOG cyst and almost exclusively located in the scaphoid;
- other tumors such as aneurismal bone cyst, giant cell tumor and chondromyxoid fibroma might affect the carpal scaphoid but their radiographic appearance is very different from that of IOG cysts.

Aseptic necrosis of the scaphoid or Preiser’s disease might demonstrate a spherical shape on radiographs. Differential diagnosis is still difficult. Diagnosis is often confirmed by clinical context, computed tomography, MRI or even anatomo-pathologic study.

Choice of the most appropriate treatment option closely depends on clinical symptomatology and radiographic evolution.

Asymptomatic lesions require a thorough clinico-radiographic evaluation of their evolutive potential (increase in the size of the IOG cyst and/or cortical erosion) which might lead to surgical treatment.

In symptomatic lesions, conservative treatment using analgesic medications might be useful in reducing pain. Surgery is indicated [1,15] in case of invalidating symptomatology resistant to conservative treatment after a period of at least 6 months [15] or in the presence of radiographic progressive signs.

Surgical treatment consists in intrallesional curetage of the IOG cyst associated with systematic autologous bone grafting in order to prevent any recurrence and the risk of collapsing fracture of the scaphoid.

A vascularized bone graft from the anterior transverse artery of the carpus performed in the same region is an alternative surgical technique. This surgical option reveals particularly well adapted and reliable in the treatment of bone cysts associated with fracture.
Table 1 Intraosseous ganglion cysts of the scaphoid.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Number of cases</th>
<th>Year</th>
<th>Clinical manifestation</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logan et al. [2]</td>
<td>1</td>
<td>1992</td>
<td>Pain</td>
<td>Curettage + bone graft</td>
</tr>
<tr>
<td>Chantelot et al. [1]</td>
<td>1</td>
<td>1998</td>
<td>Fracture</td>
<td>Curettage + bone graft + pin fixation</td>
</tr>
<tr>
<td>Chen and Shapiro [9]</td>
<td>1</td>
<td>1999</td>
<td>Pain</td>
<td>Curettage + bone graft</td>
</tr>
<tr>
<td>Yakoubi et al. [8]</td>
<td>1</td>
<td>2009</td>
<td>Fracture</td>
<td>Curettage + vascularized bone graft</td>
</tr>
<tr>
<td>Albalajo et al. [10]</td>
<td>1</td>
<td>1993</td>
<td>Pain</td>
<td>Curettage + bone graft</td>
</tr>
<tr>
<td>Castellanos et al. [7]</td>
<td>1</td>
<td>2001</td>
<td>Fracture</td>
<td>Orthopaedic</td>
</tr>
</tbody>
</table>

When properly managed, IOG cysts have a good postoperative prognosis with a low recurrence rate [8].

Conclusion

IOG cyst is a benign tumor. It rarely involves the scaphoid bone and might be symptomatic. It can be misdiagnosed as benign tumor (osteoid osteoma, enchondroma), aseptic necrosis or degenerative lesion. Therefore, only anatopathologic findings will definitively confirm the diagnosis. Curettage of the scaphoid lesion followed by packing of the defect with bone graft is indicated when conservative treatment reveals unsuccessful or in the presence of radiographic progressive signs (Table 1).

Conflicts of interest statement

Nothing declared.

References