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Symmetrical Multipartite of Lateral Fabella in a Small Breed Dog

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Abstracts : An 11-year-old, female, Maltese dog was presented with abdominal distension and intermittent slight lameness on left hindlimb. Palpable abdominal pain and purulent vaginal discharge were observed on physical examination. Severe leukopenia with toxic change, and azotemia, hyperphosphatemia, and hyponatremia were identified on blood profile. On radiographs and abdominal sonograms, remarkable soft tissue mass containing echogenic material deviating intestines craniodorsally compatible with pyometra. On stifle radiographs, 4-5 fragmented sesamoid bone (fabella) was identified on both stifle joint with medial patella luxation. Immediate ovariohysterectomy was performed and the patient was recovered well with normal blood work. No specific treatment was attempted to the left hindlimb showing minimal and intermittent lameness. No remarkable abnormal gait was reported for 3-month follow-up period. The fragmented lateral fabella is considered congenital multipartite of lateral fabella not related to the lameness.

Key words **:** sesamoid bone, multipartite, fabella, radiograph, dog**.**

Introduction

Sesamoid bone abnormailities included luxation, fracuture, and congenital fragmentation in dogs. Sesamoid bones form by the endochondral ossification of sesamoid cartilages. This ossification process is thought to be similar to that responsible for the formation of secondary ossific nuclei in long-bone epiphyses (15).

Generally two to three or multiple fragmented sesamoid bones are intermittently recognized radiographically, most commonly disturbing the medial sesamoid bone (fabella). It has been known that poodles and fox terriers are prone to this condition (1). The popliteal sesamoid, the patella, and the palmar metacarpophalangeal sesamoid bones 2 and 7 (of the second and fifth digits) also may be affected. Fractures of the lateral fabella were reported in medium or large breed dogs (9).

Since the fabella may have more than one center of ossification causing bipartite, tripartite, and multipartite, fractures of these small bones must be differentiated with the congenital sesamoid bone fragments (Owens JM). Additionally, spontaneous fracture of the lateral fabella was reported in dogs (14).

This report firstly describes a case of congenital multipartite of lateral fabella symmetrically in a small breed dog.

Case

An 11-year-old female Maltese dog was presented with abdominal distension. On the history, benign mammary gland tumor was removed surgically 3 years ago by private practitioner. And mild intermittent left hindlimb lameness has been found. On physical examination, purulent vaginal discharge and severely distended abdomen with palpable pain was observed. No perceptible hindlimb abnormalities were found except for medial patella luxation bilaterally. Complete blood count (CBC) profiles showed leukopenia (2.3×10^9 cells/l, reference range 6 to 17×10^9/l) with toxic neutrophils. The serum chemistry profile revealed azotemia (creatinine 22 mg/l, reference range 5-15 mg/l; BUN 500 mg/l, reference range 70-250 mg/l); hyperphosphatemia (93 mg/l, reference range 26-62 mg/l); and hyponatremia (134 mmol/l, reference range 141-152 mmol/l). Round and tubular abdominal mass with soft tissue density that occupies about 70% of the abdominal cavity was identified on abdominal radiographs. On stifle radiographs, multi fragmented lateral sesamoid bone (fabella) bilaterally, luxated patella medially; mild periarticular osteophytes, and slightly deviated tibia shaft medially were observed (Fig 1, 2, 3). On ultrasonographic examination, severely distended uterus containing echogenic material was observed. Pyometra with renal dysfunction and mild degenerative joint disease of stifle with patella luxation bilaterally were diagnosed. Ovariohysterectomy was successfully performed immediately under the intensive supportive treatment including intravenous fluids and antibiotics. Concerning stifle joint, no specific treatment was attempted at this moment. Soon after surgery, the patient was recovered well and its abnormal blood profile returned to normal. To date, no abnormalities was observed

Discussion

Sesamoid bone abnormalities such as luxation, fracture, bipartite, tripartite or multipartite are seen in dogs (7,11,13).

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Fig 1. Ventrodorsal hip extended radiograph. No remarkable findings were observed on the hip bone and coxofemoral joint. Note the multipartite lateral fabella bilaterally (arrows) in a dog without any evidence of gait abnormality. Medially rotated patella was observed on both hindlimbs (arrowhead).

Mostly, sesamoid bone such as the patella may be luxated leading to unstable joint conformity (2,4). Sometimes, lameness may be obvious in some animals with signs of pain on palpation by the affected sesamoid bone.

Most of the sesamoid bone disease is observed on metacarpophalangeal region in certain breed. Multipartite palmar metacarpophalangeal sesamoid bones 2 and 7 have been considered degenerative and a cause of lameness in five Rottweillers and three Labrador Retrievers that had varying degrees of associated soft tissue calcification. Meanwhile, the affected sesamoid bone is not always related with clinical signs. One study showed similar sesamoid lesions in 44% of Rottweilers that were either clinically normal or had lameness that was verified to be unconnected with the affected sesamoid bones (17). It is believed that the lesion affecting palmar metacarpophalangeal sesamoids 2 and 7 is the consequence of a congenital ossification anomaly that is commonly unassociated with clinical signs (12). Trauma is another possible cause of sesamoid fragmentation, particularly when sesamoids other than 2 and 7 are involved (8). However, "fractures" of the palmar metacarpophalangeal sesamoids 2 and 7 have been described in racing dog.

In small breed dog such as poodles and fox terriers, two to three or multiple fragmented sesamoid bones, mostly fabella, are occasionally observed radiographically (1).

Generally four sesamoid bones normally exist in the stifle joint of the dog. The largest sesamoid bone in the skeletal system is patella, or called knee cap. It has curved ovate shape and articulates with the patellar surface of the femur. There are three other sesamoid bones, or fabellae, in the stifle region. Two of these are located in the heads of the gastrocnemius muscle caudal to the stifle joint on the medial and lateral condyles. It is globular in shape, except for a truncated end, which faces distally and has a nearly flat articular surface for the facet on the caudal part of the lateral femoral condyle. The sesamoid in the medial head of origin of the gastrocnemius muscle is smaller than the lateral one, and is angular in form. It articulates with the lateral condyle of the tibia. And

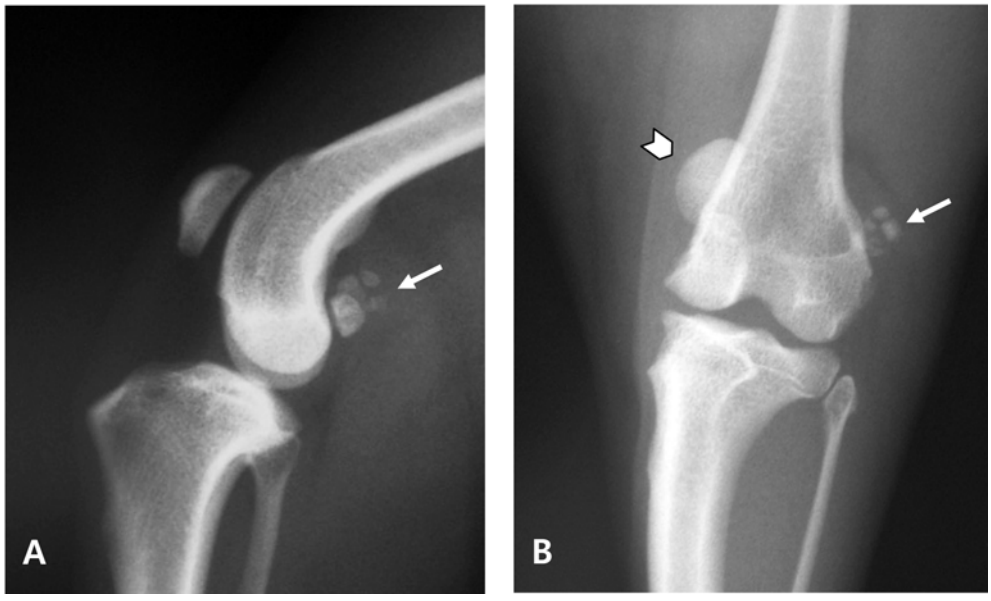

Fig 2. A lateral (A) and craniocaudal (B) radiographs of the left hindlimb. Multi-fragmented lateal fabella was identified apparently (arrows). Medially rotated patella was found on craniocaudal projection (arrowhead).

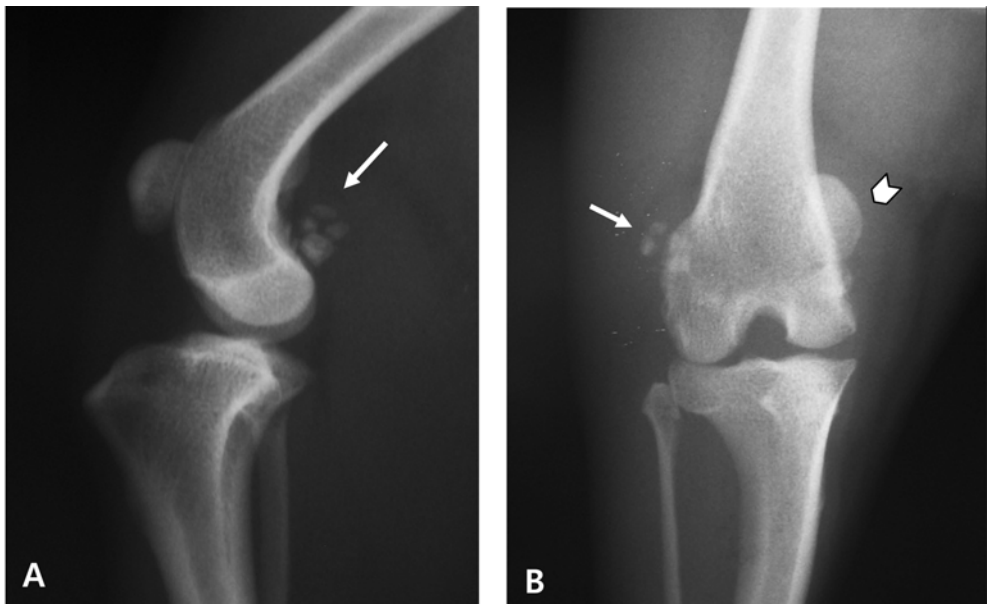

Fig 3. A lateral (A) and craniocaudal (B) radiographs of the right hindlimb. Multi-fragmented lateal fabella was identified apparently (arrows). Medially rotated patella was found on craniocaudal projection (arrowhead).

the third one, smallest sesamoid bone, is located in the tendon of the popliteal muscle, adjacent to its muscle fibers (6).

It was reported that spontaneous fracture of the lateral fabella is presented in dogs and two-piece sesamoid fractures occur most often in the feet of sled and racing dogs. Thus chronic lesion with fragmented sesamoid bone should be differentiated with bipartite or multipartite fabella (5).

Reversely, since the fabellae may have more than one center of ossification leading to possible multipartite, fractures of these bones must be differentiated (10,15). In this case, the both of the lateral sesamoid bones located in the lateral head of origin of the gastrocnemius muscle were fragmented multiply. Interestingly, both lateral fabella had symmetric multi-fragmented exactly. Though, it would be difficult to elicit that the lateral fabella known as the largest sesamoid bone located in the lateral head of origin of the gastrocnemius muscle is prone to fragmented easily (6), the larger the seasmoid bone with multiple ossification center could be fragmented multiply than smaller sesamoid bone.

The affected fabella is not likely possible to be cause of the lameness in this patient. Though, fracture could be happened in dogs without any notable trauma, the symmetric and bilateral multipartite in this patient might be associated with congenital problem rather than related with fracture. Furthermore, the mild intermittent lameness was only shown unilaterally. Mild degenerative joint disease associated with luxated patellar and senile change should be considered as an intermittent lameness in this case.

Meanwhile, Distal displacement of the popliteal sesamoids or the fabellae has been cited as a sign and useful parameter that indicates rupture or trauma to their respective tendons, although this is not always true (3,16). And also, the position alteration of the sesamoid bone located in the tendon of the popliteal muscle should be concerned for evaluation synovial joint in practice (6).

In conclusion, multipartite sesamoid bone was incidentally diagnosed on radiographs and it should be considered benign congenital fragmented fabella in this patient without any remarkable gait abnormality.

To the author's knowledge, it is the first report that spontaneous or congenital multipartite of lateral fabella symmetrically in a small breed dog.

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소형견에서 외측 무릎 종자뼈의 대칭적 다분화

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요 약 : 복부 팽만과 간헐적인 가벼운 좌측후지의 파행을 나타낸 11년령의 암컷 말티즈견이 내원하였다. 신체검사에서 복부 촉진 시 동통을 호소하였고 농성의 질 삼출물을 나타내었다. 혈액화학적 검사결과 독성변화를 동반한 심한 백혈구감소증, 질소혈증, 고인산혈증, 그리고 저나트륨혈증이 관찰되었다. 복부 방사선검사에서 소장을 앞쪽과 등쪽으로 변위시키는 연부조직음영의 관상구조를 가진 매스가 관찰되었고 복부 초음파검사에서 에코성의 물질이 함유된 종괴는 자궁음영으로 판단되어 자궁축농증으로 진단하였다. 후지의 방사선검사결과 양쪽 무릎에서 내측 슬개골탈구와 외측 종자뼈가 4-5 조각으로 분화된 다분화를 관찰하였다. 환자는 곧바로 난소자궁적출술을 받아 잘 회복되었으며 정상적인 혈액화학 수치를 보였다. 좌측 후지의 파행은 간헐적이고 매우 경미하였으므로 특별한 처치를 하지 않았다. 이후 지금까지 3개월동안 뚜렷한 후지파행은 관찰되지 않았다. 여러조각으로 갈라진 후지의 양측성 외측종자뼈는 선천적인 종자골 다분화로 여겨지며 파행과 직접적인 관련성은 없는 것으로 판단된다.

주요어 : 종자골, 다분화, 방사선촬영, 개.