

Case Report—

An Ectopic Wing in a Wild Black Vulture (*Coragyps atratus*)

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SUMMARY. An approximately 5-month-old black vulture (*Coragyps atratus*) was presented with the chief complaint of cervicomeia. A full-sized ectopic wing, with its own pectoral girdle, was found attached to the dorsal surface of the last few cervical vertebrae. There was deformation (right dorsolateral narrowing) of the spinal canal at the point of attachment with a corresponding compression of the spinal cord.

RESUMEN. *Reporte de Caso*—Ala ectópica en un gallinazo salvaje (*Coragyps atratus*).

Un gallinazo negro (*Coragyps atratus*) de aproximadamente 5 meses de edad, fue presentado con cervicomeia como el mayor problema. Se encontró un ala ectópica de tamaño completo con su propio anillo óseo pectoral unido a la superficie dorsal de las últimas vértebras cervicales. Había una deformación (estrechamiento dorso-lateral derecho) del canal espinal en el punto de la unión con una compresión correspondiente de la médula espinal.

The formation of an embryonic limb field in an atypical site has been reported in various mammals, but to our knowledge a bird with a truly ectopic wing has never been reported in the scientific literature. The bird, which died soon after it was found in the wild, was examined radiographically and histologically.

CASE REPORT

An approximately 5-month-old female black vulture was presented to the Virginia–Maryland Regional College of Veterinary Medicine Teaching Hospital by a local wildlife rehabilitator. The bird had been presented to the rehabilitator after it was found in a mountainous area of Pulaski County, Virginia. The bird was in fair body condition and appeared completely normal except for the presence of an extra wing hanging from its cervical region on the right side just outside of the thoracic inlet. All joints in the ectopic wing appeared immobile, with the exception of the articulation between the

proximal humerus and the ring-like pectoral girdle. The ectopic wing appeared to have no sensory or motor capability. It hung pendulously from the right side of the bird's neck, interfering with normal locomotor activities. The wing was covered with primary and secondary feathers (Fig. 1). Two major digits were located distally, fixed in position relative to each other.

Radiographically, the bird appeared anatomically normal except for the ectopic wing. Skeletal elements in the appendage were obviously not identical to the normal bones they represented. A bony ring representing a pectoral girdle was evident on ventro–dorsal radiographs. The humerus increased in diameter from proximal to distal. A trabecular pattern was evident within the humeral shaft, and an area of fluid density was apparent distally. There appeared to be at least three major components to the antebrachium. Two major digits, each composed of two phalanges, were evident (Figs. 2, 3, 4). Amputation of the ectopic wing was planned, as it severely hindered the vulture's normal activities.



Fig. 1. View of the live bird from the right side, dorsal surface. The ectopic wing is being held up on the bird's right side to be compared with the normal wing below. The ectopic wing was fully feathered but seemed to have no muscular attachments.

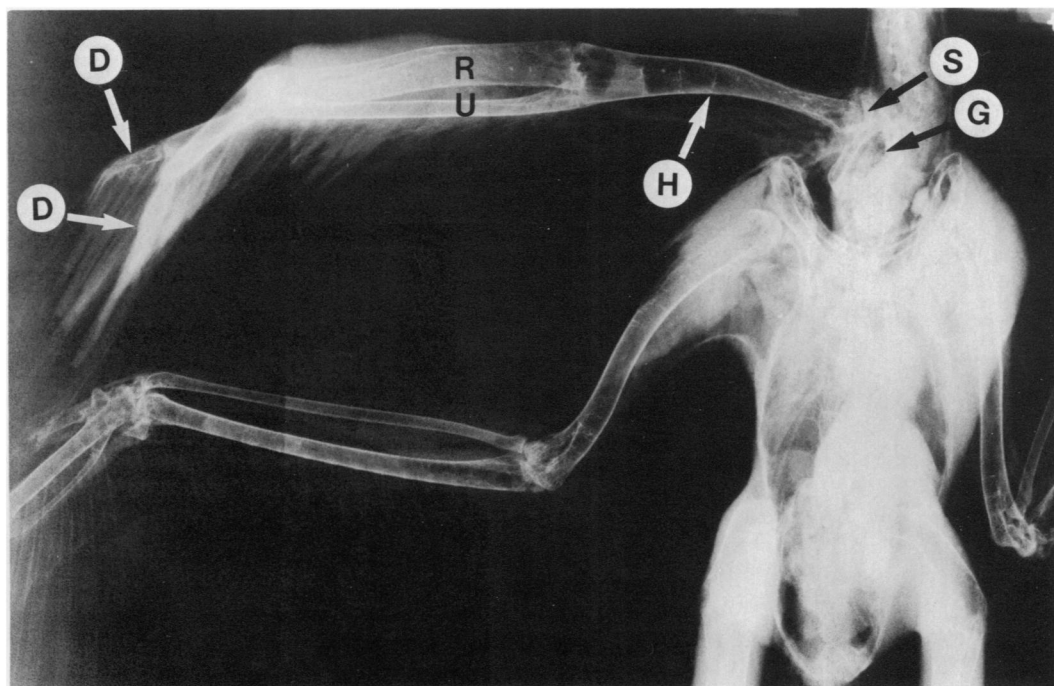


Fig. 2. Ventro-dorsal radiograph: the ectopic wing (right side) originates from the last cervical vertebrae. A miniature pectoral girdle (G) and a shoulder joint (S) are present. The humerus (H), radius (R), and ulna (U) are recognizable but abnormal. Two digits (D) of equal size are seen distally.

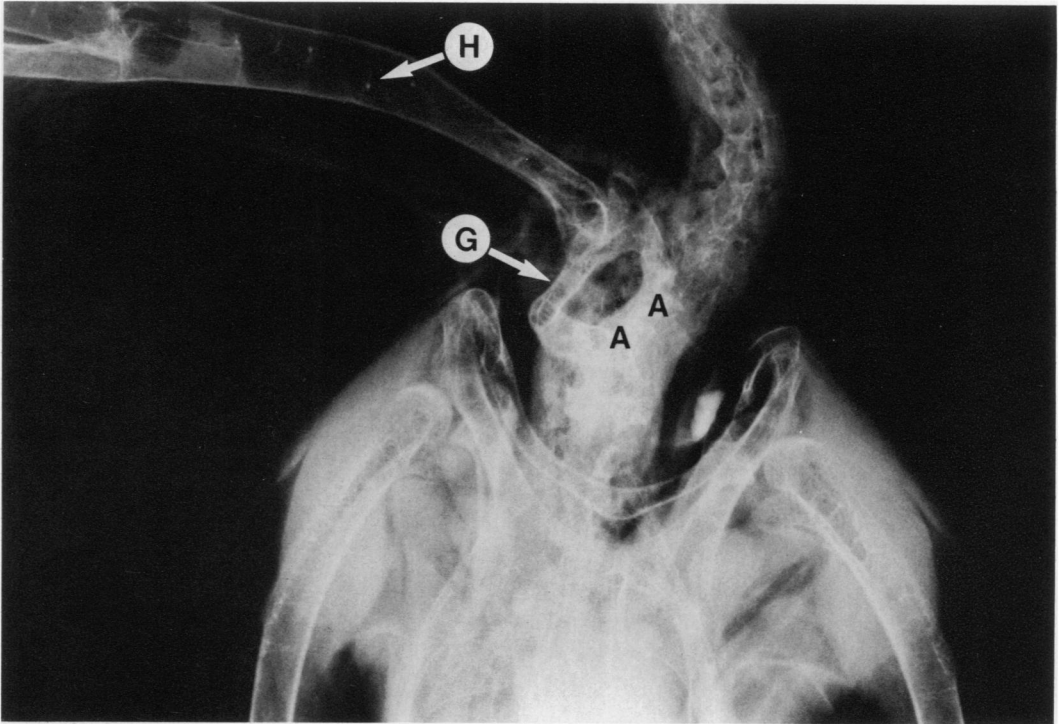


Fig. 3. Ventro-dorsal radiograph: closeup of attachment site (A) and articulation of humerus (H) with bony ring (G) representing a pectoral girdle.

After 2 weeks in captivity, the bird fractured the humerus of the ectopic limb transversely 1.5 cm away from its articulation with the bony ring. The bird died several days later of sepsis secondary to osteomyelitis of the ectopic wing. Culture of fluid aspirated from the humeral shaft yielded *Staphylococcus aureus* and a species of *Serratia*. Although the fracture was not open, we believe the limb had been abraded along the ground and had then become infected.

At necropsy, the third appendage was found to be approximately 30 cm long and 10 cm wide. The appendage originated with a bony ring measuring 2 cm × 3 cm × 1 cm attached to the dorsal surface of the caudalmost cervical vertebrae. The site of attachment involved fusion of the bones on the ventral surface of this ring with the dorsal surface of the involved vertebral bodies, as well as fibrosis of the surrounding tissues. In life, the wing hung ventrally off of the right side of the bird. Thus, the vulture did have a degree of torticollis. There was deformation (right dorsolateral narrowing) of the

spinal canal at the point of attachment with a corresponding compression of the spinal cord. Although the spinal cord was compressed dorsolaterally at this point, grossly the widths of the dorsolateral white and gray matter were identical to those of the contralateral side. Histologically, there was moderate vacuolation of white matter at the site of compression.

At the dorsorostral end of the bony ring, there was a cartilage-lined articular facet measuring 1 cm in diameter with a 1-mm intra-articular ligament of dense regular connective tissue extending across the joint space to the margin of a humeral head measuring approximately 1 cm × 1 cm × 0.5 cm. No fluid was grossly visible in this joint space.

The antebrachium of the appendage consisted of two bones proximally, presumably a radius and ulna, each of which was duplicated beginning at midshaft so that at the distal antebrachium the appendage appeared to contain four bones, each approximately 1 cm in diameter. Distal to the antebrachium, there was no

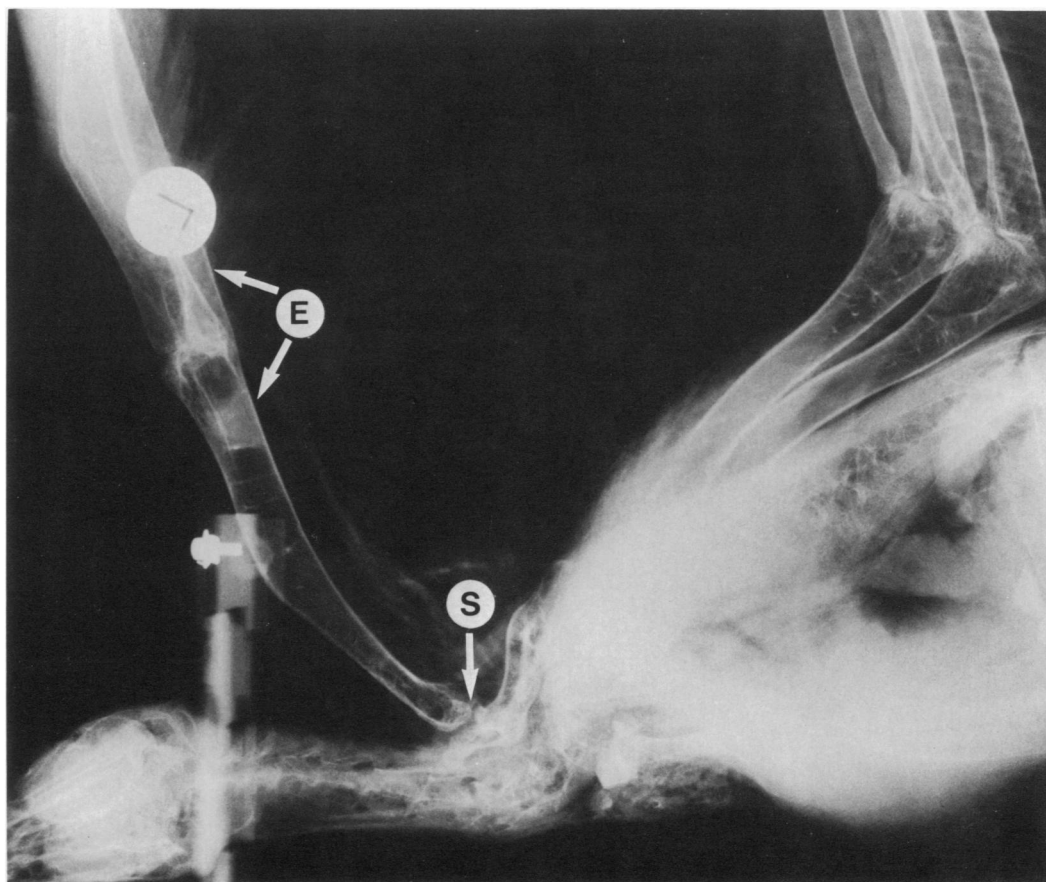


Fig. 4. Left lateral radiograph: the ectopic wing (E) has been distracted dorsocranially, facilitating observation of the shoulder joint (S).

visible radiocarpal bone, and the distal appendage consisted of large flight feathers embedded in the skin attached to the most distal longitudinal bones representing digits. The caudal cervical vertebrae were attached to the ectopic limb's pectoral girdle via fusion; no joint space or line of demarcation was identifiable.

Histologically, the midshaft of the antebrachium actually contained five bones. Three consisted of poorly organized trabeculae of immature bone and cartilage surrounding a mesenchymal core with large irregular cavities partially filled with proteinaceous debris. The other two bones consisted of mature haversian bone organized into circular cortices. Irregular spicules of fine haversian bone, with no evidence of osteoblasts, extended from both endosteal and periosteal surfaces of both of these

bones. No neural or muscular elements were identified within the wing grossly or histologically.

DISCUSSION

We believe that a truly ectopic wing has not been previously reported in the scientific literature. An ectopic wing, with an abnormal anatomic site of attachment, is to be distinguished from duplication, whereby an embryonic limb bud in a proper location somehow is split before development of a normal appendage. Notomelia, in which a limb is found on the dorsum of an animal, has been reported in various mammals (1). Perineomelia, reported in dogs and cattle, involves an ectopic limb projecting from

the perineum. These malformations are due to the development, in the embryo, of a limb field in an atypical site. In the case of perineomelia, all or parts of the pelvis are often present (1). The ectopic limbs almost always lack muscle tissue and usually have fused joints (1), as was the situation in the three-winged vulture. It is unclear whether the lack of muscle is because

of an embryonic absence of myotome-derived cells or because of a secondary muscle degeneration from lack of innervation (1).

REFERENCE

1. Noden, D. M., and A. de Lahunta. The embryology of domestic animals. Williams and Wilkins, Baltimore, Md. 1985.