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CORRECTIVE RADIAL AND ULNAR OSTEOTOMY FOR AN ANTEBRACHIAL DEFORMITY WITH IDIOPATHIC ETIOLOGY IN A TWO-YEARS-OLD MALE DOG: –A CASE REPORT

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Abstract: *A two-years-old male mixed-breed dog rescued as a stray animal was evaluated for a left antebrachial deformity. Previous medical history was unavailable, and the onset and etiology of the deformity could not be established. Orthopedic examination revealed specific limb malalignment, lameness severity and abnormalities in joint range of motion. Diagnostic imaging characterized the location and configuration of the radial and ulnar deformities and was used to assess adjacent joint congruity. Corrective radial and ulnar osteotomies were performed without preoperative deformity planning. Internal fixation was achieved using a bone plate. Postoperative management included carprofen for analgesia, amoxicillin and clavulanic acid to prevent secondary infections and application of an orthopedic brace to provide additional limb support and reduce excessive mechanical loading on the fixation plate. Postoperative radiographs demonstrated clear improvement in osseous alignment following corrective osteotomy. At long-term clinical follow-up, the affected limb exhibited satisfactory alignment, a normal range of motion of the assessed joints, and improved overall mobility. This case highlights the importance of considering both anatomical alignment and functional recovery when assessing the outcome of corrective antebrachial osteotomy. Clinical evaluation of joint range of motion and overall mobility complements the radiographic assessment of skeletal realignment by documenting its functional implications. Together, these assessments provide a clinically meaningful framework for evaluating the response to surgical correction in dogs with antebrachial deformities of undetermined etiology.*

• Introduction

Antebrachial deformities in dogs represent a heterogeneous group of orthopedic conditions involving abnormal alignment of the radius and ulna that may compromise limb function and joint mobility [Ramadan, Vaughan, 1978; Olson, 1981; Vanderwater, Olmstead, 1983; Johnson, 1994]. Clinical assessment and diagnostic imaging are essential for characterizing the deformity, evaluating the adjacent joints, and determining the objectives of surgical correction [Dismukes, 2008; Knapp, 2016]. Outcome assessment should consider both postoperative skeletal alignment and the functional use of the affected limb [Balfour, 2000; Derudder and Snelling, 2014; Tzimtzimis and Rutherford, 2025]. Determining the underlying cause can be challenging when the patient's medical history is unavailable. In dogs rescued as strays, the absence of information regarding previous trauma and skeletal development may prevent a definitive etiological diagnosis.

• Material and method

The patient used in this study was a two-years-old male mixed-breed dog rescued as a stray was evaluated for a left antebrachial deformity. Previous medical history was unavailable, and the onset and etiology of the deformity could not be established. Orthopedic examination revealed specific limb malalignment, lameness severity and abnormalities in joint range of motion. Diagnostic imaging characterized the location and configuration of the radial and ulnar deformities and was used to assess adjacent joint congruity [Adams, 2017; De Armond, 2022; Fox, 1995; Dismukes, 2008; Knapp, 2016].Corrective radial and ulnar osteotomies were performed without preoperative deformity planning. Internal fixation was achieved using a bone plate [Wallace, 1992; Balfour, 2000; Derudder and Snelling, 2014]. The diagnostic radiography was performed at the "Tierarztpraxis Plus Waghaeusel GmbH" in Germany. The postsurgical radiography was performed at the „Genesis Veterinary Clinic" Arad, while the surgery was realized at the „Genesis Veterinary Clinic" Timisoara. The site of the lesions was identified between third and fourth cervical vertebrae and the spinal reflexes of the animal limbs were untouched.

• Results and discussions

The diagnosis of valgism was established based on clinical signs and radiographic imaging highlighting an angular deviation of radius and ulna away from the sagittal plane (Figure 1 a, b) [Ramadan and Vaughan, 1978; Fox, 1995; Knapp, 2016]. An oblique radial osteotomy was performed without removal of a bone wedge. A surgical burr was used to contour and smooth the bone surfaces: in the first part, a transversal osteotomy of 2 mm was performed at the same level on radius and ulna, after, the edges of the bone were milled and realigned until the valgism was solved (Figure 2 b). The correction was stabilized with a bone plate and screws. The plate was placed on the cranial surface of the radius ensuring stability and stiffness (Figure 3 a). Following fixation, construct stability, contact between the osteotomy surfaces, tendon gliding, and adjacent joint mobility were assessed. To ensure that the corrective radial and ulnar osteotomy was appropriate performed, a latero-lateral and dorso-palmar radiography was made (Figure 4 a, b) [Dismukes, 2008]. To avoid any post operatory complications, to enhance a faster healing, to provide additional limb support and reduce excessive mechanical loading on the fixation plate was applied an orthopedic brace on the affected forelimb, immediately after the surgery, for a month. The gait of the animal at 24 hours after surgery, the patient feels well and walks normally (Figure 5 a), while after five months, the dog showed normally gait and posture which certifies that the procedure was well performed (Figure 5 b). No follow-up radiographs were performed after the patient's discharge. Stable fixation plays a fundamental role in maintaining the corrected alignment and promoting bone healing. Internal fixation using bone plates andagg screws provides mechanical stability at the osteotomy site, while appropriately selected implants facilitate fixation of the corrected bone segments [Wallace, 1992; Balfour,2000]. Although corrective osteotomy generally provides favorable clinical outcomes, potential complications include delayed bone healing, implant-related problems, surgical site infection, and residual deformity. Careful surgical planning, appropriate fixation, and postoperative monitoring are therefore essential to optimize clinical results [Balfour, 2000; Tzimtzimis and Rutherford, 2025].



Figure 1. (a) Image of the patient before surgery showing valgism;



Figure 1. (b) Imaging confirmation of valgism.



Figure 2. (b) Image showing the aspect of radius and ulna in section after the osteotomy.

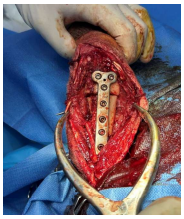


Figure 3. (a) Final aspect of the repaired bones before closure;



Figure 4. (b) Post operative dorso-palmar radiography showing the internal fixation

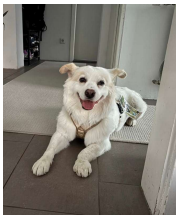


Figure 5.(b) Post operative evolution of the patient after 5 months.

• Conclusions

The osteotomy line of the radius and ulna were milled until they result parallel with the underlying joint as corrective procedure of valgism. Using the internal fixation in this procedure provide internal stabilization of bone segments, maintaining anatomical reduction, ensuring mechanical stability at the osteotomy site and prevent secondary infections comparatively with external fixation. Postoperative clinical outcomes confirm pain remission, early return to weight-bearing and a considerable improvement in patient mobility. However, long-term success remains conditional strict management of physical activity during the bone healing period. In conclusion, radial closing wedge osteotomy combined with ulnar osteotomy or ostectomy, when indicated, represents a valuable surgical option for the correction of antebrachial valgus deformity in dogs.

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