BICEPS TENODESIS WITH A BIOABSORBABLE BONE ANCHOR USING BONEWELDING® TECHNOLOGY: RESULTS IN FIVE CLINICAL CASES

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Background

Surgical treatment options for biceps tendon pathologies include tenotomy and tenodesis. Because of its ease and the commonness of arthroscopy in recent years, arthroscopic tenotomy has become the mainstay of therapy of biceps tendonitis or partial rupture among many surgeons. However, the only study thus far has reported a prolonged recovery in some of the dogs treated.[4] A study showing superiority between the two procedures is lacking, however, it has been stated anecdotally that working dogs have a faster recovery with tenodesis.[3] This case series describes five working or sporting dogs with biceps tendon pathology which were treated with tenodesis using a bioabsorbable bone anchor inserted with BoneWelding® Technology.

Case Description

Five working and/or sporting dogs were included (3 female, 2 male). Breeds were Malinois, Rottweiler, German Shepherd, Rhodesian Ridgeback, and Sheltie. Mean body weight was 29.62 kg (range 8.6 – 41 kg). Age ranged from 1 to 8 years (mean 3.6 years). History in four dogs was acute lameness after stepping into a hole or play with another dog, whereas one dog was chronically progressively lame. Four dogs were grade 3/5 lame and one dog grade 4/5. All dogs had orthopaedic ultrasound performed, three dogs had additionally CT and diagnostic arthroscopy performed.

Three dogs had partial rupture of their biceps tendon (two acute, one chronic) and two dogs had acute traumatic luxation of the biceps tendon with partial fibrillation in one dog and partial tear in the other. In all dogs, the biceps tendon was released as proximal as possible and shortened to a point where it approximated its original length with regards to a more distal insertion point mediodistal to the tuberculum majus. Tendons were reinserted with a Bunnel-Mayer suture with Prolene 0 (Prolene 2/0 in the Sheltie) and a WELDIX® suture anchor (2.3 mm diameter, 7.2 mm length) after predrilling with an implant specific drill bit (1.8mm diameter, 7.25mm length).

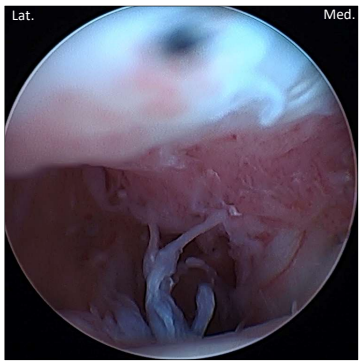
PostOP care instructions included leash walk only with restriction and gradual increase in exercise for 12 weeks, NSAID for 10-14 days and cefazoline for 7 days in one case with pre-existent skin irritations. Passive ROM and balance exercises as well as massage were performed by all owners. Two dogs came in for regular physiotherapy including laser, electromagnetic field therapy, and underwater treadmill. One dog did online physiotherapy at home including pool swimming due to the first COVID-19 wave. One dog (the one with the irritated skin) developed seroma and later an infection and therefore did not do any physiotherapy except for home exercises performed by the owner. The fifth dog only did home exercises as per the owner's choice.

Two dogs were already free of lameness one week post-op. One dog was free of lameness two weeks post-op and one dog three weeks post-op. The dog that developed a seroma around the time of suture removal went from a grade 4/5 to a grade 1/5 lameness at the time of suture removal. He then developed an infected seroma, which was treated based on antibiogram with amoxicillin-clavulanic acid. At 5 weeks postop, he was also free of lameness.

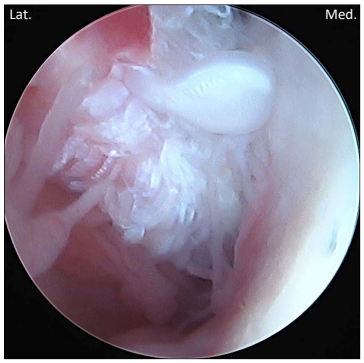
Last follow-up ranged from 3 to 23 months. All dogs were free of lameness. Three dogs went back to full exercise including sports and working without any restrictions. The other two went back to working and sports but on a less extreme level than before, but this was based on the owner's decision.

Ultrasound image of the partially torn left biceps tendon in the Rhodesian Ridgeback.

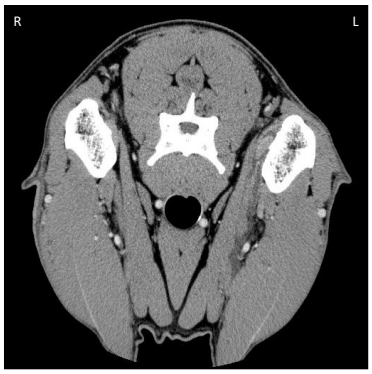
Ultrasound image of the contralateral healthy tendon in the Rhodesian Ridgeback.



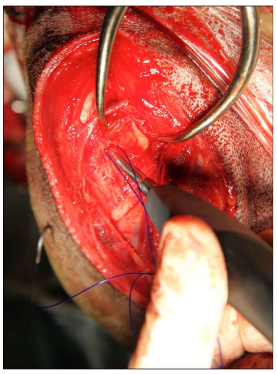
Arthroscopic image of the GSH. Note the biceps tendon has dislocated from the sulcus medially.



Arthroscopic image of the Sheltie with biceps tendon luxation, view into the sulcus. Note the tendon is not only luxated but notably partially torn.

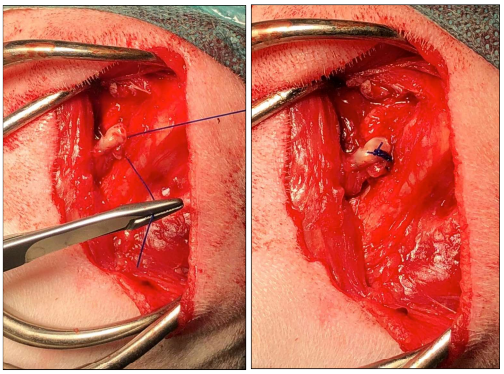


CT Image of the GSH with biceps tendon luxation on the left. Note the increased filling of the biceps tendon sheath in its entire length and the unusual position of the biceps tendon.



Insertion of the bone anchor with a Sonotrode using BoneWelding® technology in the Malinois (right humerus).

Inserted bone anchor with loose Prolene in the GSH (left humerus). The biceps tendon is shortened such that tension is appropriate at the new insertion point.



Tying down of the knot after Bunnel Mayer suture pattern in the Sheltie (left humerus) and final appearance.

Conclusion

Biceps tenodesis with a WELDIX® suture anchor led to freedom of lameness within 1-5 weeks after surgery in this case series of five dogs. Return to full working or sports without restrictions is possible. The recovery period after arthroscopic tenotomy appears to be longer until resolution of lameness and return to full exercise in sports and working is less likely. This case series provides additional evidence to the hypothesis that tenodesis results in faster return to function, especially in working dogs, when compared to arthroscopic tenotomy.

References:
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3. Rochat MC. The Shoulder. In: Tobias KM, Johnston SA (eds.): Veterinary Surgery Small Animal, Elsevier Saunders, 2012; pp 692-708
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