Is there enough evidence to recommend surgical treatment as opposed to conservative treatment for dogs affected by bicipital tenosynovitis?

A Knowledge Summary by

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KNOWLEDGE SUMMARY

Clinical bottom line

There is currently insufficient evidence to conclude that tenotomy or tenodesis has a better outcome compared to conservative treatment in cases of canine bicipital tenosynovitis.

Question

Is surgical treatment with tenotomy or tenodesis superior to conservative treatment for canine bicipital tenosynovitis?

The evidence

There is insufficient evidence for clinical decision-making regarding recommendation of surgical treatment versus conservative treatment.

Summary of the evidence

Bruce, W.J. et al. (2000)	
Population:	Dogs with bicipital tendinitis, lame with pain localised to the biceps tendon, definitive diagnosis was established on the basis of clinical, sonographic and radiographic findings, synovial-fluid analysis.
Sample size:	15 dogs n=15
Intervention details:	13 dogs initially underwent conservative treatment with rest (cage or small room and only short walks on a leash for six weeks and after improvement controlled walks on a leash for six weeks, followed by gradual return to normal exercise level) together with 2 to 4mg/kg daily carprofen for 2 or 3 weeks or a single peri-tendinous injection of 20 to 40mg of Methylprednisolone acetate and rest. Surgical treatment was done in 3 cases, 1 case that failed to improve after conservative treatment was treated by tenodesis and 2 additional cases were treated by either tenodesis or tenolysis.
Study design:	Non-comparative study (case series).
Outcome studied:	Subjective: Re-examination by the authors at six weeks by lameness and shoulder assessment, sonography was done in 4 dogs, long-term follow-up was obtained by a telephone interview of the owners' assessment and outcome was classified as excellent (never lame), good (only lame after heavy activity), fair (lame after moderate or normal activity) or poor (always lame, no improvement) according owners' assessment.

Main findings: (relevant to PICO question):	Sonography was considered to be more sensitive by the authors than radiography or arthrography in characterising the lesion. Conservative treatment resulted in good to excellent long-term results in 11 cases. In the 3 surgically treated cases the case which didn't improve after conservative treatment also didn't improve after surgery, another case improved and 1 case which didn't improve had the diagnosis osteosarcoma in the follow-up time. 10 of 11 dogs treated conservatively showed improvement at a six-week follow-up. Time to resolve the lameness ranged from 2 weeks up to seven months.
Limitations:	A comparison between different treatments was not possible due to a lack of randomised treatment groups. Only subjective assessment of treatment effect and therefore only a moderate rating about conservative versus surgical therapy can be made.
Wall, C.R. et al. (2002)	
Population:	Diagnosis was based on clinical examination and diagnostic imaging, if conservative treatment (1 or 2 times intra-articular injection of long-acting corticosteroids) failed, surgery was performed.
Sample size:	5 dogs n=5
Intervention details:	Initial treatment included intra-articular injection of 1.0mg Triamcinolone acetonide and exercise restriction in 4 dogs and a tapering dose of carprofen with exercise restriction in 1 dog. If the dog didn't respond to conservative treatment or after recurrence a bipolar radiofrequency electrosurgical system was used for arthroscopic transection of the bicipital tendon.
Study design:	Non-comparative study (case series)
Outcome studied:	Subjective revaluation 2 weeks after surgery which included a walk, follow-up 2 and 6 months following surgery which included gait at walk and trot, shoulder range of motion and pain assessment with palpation and shoulder movement. Owner questioned regarding activity level and use of NSAIDs, results were placed into an objective rating scale and were assigned a rating of excellent, good, fair or poor.
Main findings: (relevant to PICO question):	Outcome after surgery of 4 dogs were rated as excellent and in 1 dog as good.
Limitations:	Subjective assessment of treatment outcome, no control group or different treatment groups for comparison, limited case number.
Stobie, D. et al. (1995)	
Population:	Medical records from 1985 to 1992 of dogs with bicipital tenosynovitis, for medical treated cases where the diagnosis was based on clinical examination and radiographic features of bicipital tenovaginitis. For surgical cases the diagnosis has to be additionally

	confirmed by histology, owners had to be available for follow-up information in all cases, additional arthrogramm was done in 12 cases and arthrocentesis in 17 cases.
Sample size:	26 dogs (29 shoulders) n=26
Intervention details:	21 of 29 shoulder joints were treated conservatively with methylprednisolone acetate injections (if no improvement was observed injection was repeated after 2 weeks, number of injection ranged from 1 to 3) and restricting exercise of 2 weeks (restriciting exercise was not precisely defined). If lameness didn't improve injections were repeated at 2-week intervals (maximal 3 times). 14 cases underwent tenodesis of the biceps tendon and exercise restriction for 6 to 8 weeks (restricting exercise was not precisely defined) following surgery (6 of them had poor results after medical treatment and therefore underwent surgery).
Study design:	Retrospective case series
Outcome studied:	Efficacy of treatment was determined at the last physical examination and rated as excellent, good, fair or poor according to gait, limb function, range of motion and signs of pain. Results were also assessed on follow-up information from the owners regarding activity level, degree of lameness, need of anti-inflammatory drugs and ability to work. Results were considered to be excellent (never lame), good (only lame after heavy activity), fair (lame after moderate activity) and poor (always lame). 17 conservative treated cases and 12 of the surgically treated cases were available for clinical evaluation.
Main findings: (relevant to PICO question):	Of 17 conservative treated cases 3 were rated as excellent, 4 as good, 4 as fair and 6 as poor in the clinical revaluation. 8 of 12 clinical available surgically treated cases were rated as excellent and 4 as good. Owners reported excellent results in 3, good results in 7, fair results for 5 and poor for 6 of 21 medically treated cases. Of 14 surgically treated cases 11 were rated as excellent and 3 as good. Time to achieve good or excellent clinical results after surgery ranged from 2 to 9 months.
Limitations:	Retrospective study and therefore not randomized control study, only subjective assessment. Seventeen of 21 medically treated shoulders (16 dogs) and twelve of 14 surgical treated shoulders (11 dogs) were available for clinical reevaluation. Owner assessment was available for all dogs. Lost of follow-up in some cases, low number of cases.

Appraisal, application and reflection

The purpose of this Knowledge Summary was to look for evidence regarding different outcomes of tenotomy or tenodesis of the biceps brachii compared to non-surgical treatments in canine bicipital tenosynovitis/tenovaginitis by reviewing veterinary literature.

So far there are a few publications reporting different surgical techniques, but a real comparison between non-surgical and surgical treatments of canine bicipital tenosynovitis is lacking in veterinary literature. Three non-comparative studies were found in the literature. All studies suffer, besides the weakness of being retrospective, in having an objective measurement of the therapy outcome. Furthermore, the diagnostic challenge of shoulder pathologies was not considered in those studies. Many shoulder diseases have similar clinical and radiographic appearances. Diagnosis of bicipital tenosynovitis was based in all mentioned studies on clinical signs and radiographs only. Therefore, other shoulder disorders cannot be definitively excluded. Furthermore, it needs to be mentioned that non-surgical therapies can have a positive effect independent of treating bicipital tenosynovitis or another shoulder disorder, as they are non-specific treatments.

In a descriptive study of 15 cases from Bruce et al. (2000) good or excellent function at long-term follow-up was recorded for 11 of 13 conservative treated cases. On the basis of only 3 surgically treated dogs a comparison between conservative and surgical treatment of bicipital tenosynovitis in that study cannot be made. In addition the clinical follow-up was made without an objective measurement and the long-term follow-up was only done by the owners. This may have influenced the promising results of conservative treatment. The only possible implication for the practice from this study is that recovery time after conservative treatment can range from 2 weeks up to 7 months. This finding, even if it's just from a case series, emphasises the importance of rest, as a considerable element of conservative treatment. The dogs were restricted to cage or small room for 6 weeks and another 6 weeks to the house of yard with controlled walks on a leash.

Another case series was published from Wall et al. (2002). All dogs initially underwent conservative treatment but because lameness remained, arthroscopic tenotomy of the biceps brachii was done in all of them. The long-term outcome after arthroscopic tenotomy was good to excellent. There is not much information from this report to conclude whether conservative or surgical therapy of bicipital tenovaginitis is better, but all dogs improved post tenotomy compared to the presurgical condition

In a retrospective study of Stobie et al. (1995) 29 cases of bicipital tenovaginitis were included. In the medical treated cases only 7 of 17 cases were clinically rated as good or excellent and owners reported good to excellent results in 10 of 21 cases. The moderate outcome of the conservative treatment in this study is opposed to the promising results of conservative treatment of Bruce et al. (2000). These conflicting results may be due to the difference in the length of prescribed rest as part of conservative therapy. All dogs, which could be evaluated clinically after tenodesis, had an outcome of excellent to good. Owners also rated the outcome of all surgically treated dogs as excellent to good. This result corresponds to the result of Wall et al. (2000) and leads to the assumption that tenodesis may be promising and a good option if conservative treatment fails.

In conclusion, there is insufficient evidence to support conservative therapy more than surgical treatment or vice versa. The only conclusion for clinical practice that can be made based on the literature is that if conservative treatment failed surgical therapy may be an option that may lead to improvement.

Methodology Section

Search Strategy	
Databases searched and dates covered:	The following search terms were applied to the PubMed database, accessed via the NCBI website (1910-2015) and the CAB abstracts database (1973-2015) accessed on the OVID platform, Scopus, Web of Science, VetMed Resource
Search terms:	dog OR dogs OR canine OR bitch* OR dogs/ OR bitches OR canis/ AND biceps OR bicipital* AND tendonitis OR tendinitis OR tenosynovitis OR "inflammation ADJ5 tendon*" AND tenotom* OR transect* OR treat* OR manag* OR therap* OR treatment/ or management/ OR therapy/
Dates searches performed:	January 2016

Exclusion / Inclusion Criteria	
Exclusion:	Non-English language, reviews, case reports, conference papers
Inclusion:	Studies which investigated and compared the outcome of conservative and surgical therapy in bicipital tenosynovitis

Search Outcome

Database	Number of results	Excluded – duplicates	Excluded – not English language	Excluded – did did not answer the PICO question	Total relevant papers
PubMed	16			13	3
Scopus	26	2	3	25	1
Web of Science	49	1	1	47	2
CAB Abstracts	29		2	27	2
					3

CONFLICT OF INTEREST

The author declares no conflict of interest.

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