

Rowan University

## Rowan Digital Works

---

Rowan-Virtua Research Day

25th Annual Research Day

---

May 6th, 12:00 AM

### Flexor Tenosynovitis After Bite by Sugar Glider

Dominick Siconolfi  
*Rowan University*

James Espinosa  
*Rowan University*

Alan Lucerna  
*Rowan University*

Russell Mordecai  
*Rowan University*

Follow this and additional works at: [https://rdw.rowan.edu/stratford\\_research\\_day](https://rdw.rowan.edu/stratford_research_day)



Part of the [Infectious Disease Commons](#), [Musculoskeletal Diseases Commons](#), [Orthopedics Commons](#), and the [Pathological Conditions, Signs and Symptoms Commons](#)

Let us know how access to this document benefits you - share your thoughts on our [feedback form](#).

---

Siconolfi, Dominick; Espinosa, James; Lucerna, Alan; and Mordecai, Russell, "Flexor Tenosynovitis After Bite by Sugar Glider" (2021). *Rowan-Virtua Research Day*. 49.  
[https://rdw.rowan.edu/stratford\\_research\\_day/2021/may6/49](https://rdw.rowan.edu/stratford_research_day/2021/may6/49)

This Poster is brought to you for free and open access by the Conferences, Events, and Symposia at Rowan Digital Works. It has been accepted for inclusion in Rowan-Virtua Research Day by an authorized administrator of Rowan Digital Works.



# Flexor Tenosynovitis After Bite By Sugar Glider

Dominick Siconolfi, DO, PGY3\*, James Espinosa, MD\*\*, Alan Lucerna, DO\*\*, Russ Mordecai, DO\*\*

\*Rowan University School of Osteopathic Medicine, Stratford, NJ \*\*Jefferson Health NJ

## INTRODUCTION

Flexor tenosynovitis is one of the few orthopedic emergencies, often first identified in the emergency department. Pyogenic flexor tenosynovitis is an infection of the flexor tendon sheath of a finger causing local inflammation and tissue destruction. The pathognomonic symptoms of flexor tenosynovitis are known as Kanavel's signs, a constellation of symptoms that include: pain with passive extension of the finger, tenderness over the flexor tendon sheath, fusiform swelling of the affected finger, and the finger held in passive flexion. The most common cause of flexor tenosynovitis is penetrating trauma into the flexion tendon sheath. Our case involves a 59 year old male who presented to the emergency department with left second finger pain and swelling after sustaining an bite by a domesticated sugar glider.

## BACKGROUND

The sugar glider, *Petaurus breviceps*, is a small marsupial that is one of the most commonly traded exotic pets in the United States. They were first brought to the United States for trade in the 1990s (5). They are naturally found in Australia, Indonesia, and New Guinea, and were later introduced to Tasmania. They have been domesticated as house pets and are gaining in popularity as exotic pets in multiple countries. However, in the United States certain states require licenses to own a sugar glider, with several states banning ownership of these marsupials. The sugar glider is considered a carrier for zoonotic diseases, and have been found to carry some dangerous pathogens, including: *Citrobacter*, *Enterobacter*, multi-drug resistant *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* (4).

Flexor tenosynovitis is an infection of the flexor tendon sheath usually after direct trauma or after an animal bite. The infection will usually consist of skin flora and bacteria on the object on in the mouth flora of biter. (2)

## CASE REPORT

A 59 year old male with a past medical history of diabetes with a reported allergy to insulin not taking any medications presented to the emergency department 4 days after being bit on the left second finger after by a domesticated sugar glider. The patient was presenting with left second finger pain and swelling, with difficulty moving it because of pain. He had tried soaking his hand in peroxide the day after the bite, thought there may have been initial improvement, however the finger eventually worsened and he sought evaluation at the emergency department.

On initial evaluation, the patient presented with a swollen, erythematous second left finger that was held in slight flexion, with tenderness along the palmar surface, and had pain with passive extension of the finger. There was immediate concern for flexor tenosynovitis, with a differential diagnosis of osteomyelitis, cellulitis, and edema. The patient was immediately given intravenous antibiotics and orthopedics was consulted for high clinical concern for flexor tenosynovitis. After diagnostics and clinical evaluation by the orthopedic team, the patient was diagnosed with flexor tenosynovitis and the OR was scheduled for left index finger irrigation and debridement.

Aerobic and anaerobic wound cultures were taken intraoperatively which grew *Pasturella multacolda* and *Staphylococcus aureus*.

The patient remained in the hospital after surgery, but his course was complicated by hyperglycemia. The patient decided against taking any medications other than his antibiotics after discharge, although he did take medications while in the hospital.

The patient decided to leave the hospital against medical advise for personal concerns, and was transitioned to oral Bactrim and Augmentin by Infectious Disease for discharge. The patient was lost to follow-up after leaving the hospital.



Image of a finger with flexor tenosynovitis

Image courtesy of Ortho Bullets (6)



- X-ray of patient's left hand demonstrating diffuse swelling of the index finger.

## DISCUSSION

- Infectious flexor tenosynovitis is a potentially devastating, but relatively uncommon pathology of the hand, representing around 9.4% of all hand infections in one large series study that can lead to necrosis and destruction of the tendon sheath and surrounding structures. The classic description of Kanavel's signs for tenosynovitis, first described in 1912 by Dr. Allen Kanavel, consist of 1) a finger held in slight flexion, 2) pain with forced extension, 3) fusiform swelling, and 4) tenderness over the flexor sheath (3). The patient may or may not present with fever. These signs are very sensitive (91%-97%) but not very specific (51%-69%) for diagnosing flexor tenosynovitis (2). Any tenderness over the flexor surface of the finger must be concerning for flexor tenosynovitis if there was preceding injury or bite wound. This pathology most commonly occurs after direct inoculation from trauma or bite wound to the flexor tendon sheath. High clinical suspicion is required, as prolonged time to diagnosis can lead to devastating and debilitating consequences for the patient. Treatment requires administration of intravenous broad spectrum antibiotics and immediate orthopedic consultation and evaluation. Although literature supports close observation in early flexor tenosynovitis while receiving antibiotic and anti-inflammatory medications., without early clinical improvement, surgery will be necessary to prevent further progression of the disease. There are three different tiers of staging in flexor tenosynovitis and surgical approach is guided by staging of the infection, led by the orthopedics team. With early intravenous antibiotics and orthopedic intervention, prognosis is more favorable. Long term complications include tendon necrosis, finger deformity, and finger stiffness. The mouth flora of the sugar glider have been found to include include: *staphylococcus spp* (most common), *Enterococcus faecalis*, *Streptococcus viridians*, *Acinetobacter calcoaceticus*, *Enterococcus faecium*, *Pasteurella spp.*, *Staphylococcus delphini* and *Escherichia coli* (1). This presents a diverse flora, potentially devastating to human tissue, and so antibiotic treatment must be broad and swift.

## CONCLUSION

- This case offers an opportunity to review an orthopedic emergency caused by an uncommon perpetrator. Presented is a case of flexor tenosynovitis occurring after a bite wound from a sugar glider. *Pasteurella multocida* and *Stahylococcus aureus* grew from wound cultures taken intraoperatively, common pathogens found in mammalian bites. It can be drawn from this that non-emergent bite wounds from the sugar glider can be treated with oral antibiotics similar to other mammal bites for similar pathogen coverage. However, as in this case, more severe cases will require intravenous antibiotics and surgical intervention.

## REFERENCES

- Diana, H., Saleha, A., Azlan, C., Bejo, S., Zunita, Z. and Fauziah, N., 2016. *ORAL MICROBES OF PET SUGAR GLIDERS AND DETECTION OF SALMONELLA IN THEIR FAECES*. [online] Jvm.vam.org.my. Available at: <http://jvm.vam.org.my/wp-content/uploads/2016/12/2016-Issue-2\_Prof-Saleha.pdf> [Accessed 7 March 2021].
- Sexton, MD, D. and Leversedge, MD, F., n.d. *Infectious tenosynovitis*. [online] Uptodate.com. Available at: <https://www.uptodate.com/contents/infectious-tenosynovitis?search=flexor%20tenosynovitis&source=search\_result&selectedTitle=1~39&usag e\_type=default&display\_rank=1#references> [Accessed 9 March 2021].Re
- Kennedy MD, C., Huang MD, J. and Hanel MD, D., 2016. *Kanavel's Signs and Pyogenic Flexor Tenosynovitis*. [online] Link.springer.com. Available at: <https://link.springer.com/content/pdf/10.1007/s11999-015-4367-x.pdf> [Accessed 9 March 2021].
- Varriale L, Russo TP, Pace A, Mediatore S, Borrelli L, Santaniello A, Menna LF, Fioretti A, Dipineto L. Microbiological survey of sugar gliders (*Petaurus breviceps*) kept as pets in Italy. Lett Appl Microbiol. 2019 Dec;69(6):399-402. doi: 10.1111/lam.13233. PMID: 31618795.
- Campbell CD, Pecon-Slaterry J, Pollak R, Joseph L, Holleley CE. The origin of exotic pet sugar gliders (*Petaurus breviceps*) kept in the United States of America. PeerJ. 2019 Jan 8;7:e6180. doi: 10.7717/peerj.6180. PMID: 30643698; PMCID: PMC6329365.
- Yoon, R. Pyogenic Flexor Tenosynovitis. *Orthobullets* (2016). Available at: https://www.orthobullets.com/hand/6105/pyogenic-flexor-tenosynovitis. (Accessed: 31st March 2021)