

Rubber Band Syndrome: A Sonographic Diagnosis

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Abstract: Rubber band syndrome is a very rare condition due to forgotten band around various body parts leading to complications. A 3 year old male child presented with complaint of swelling in the left distal forearm, wrist and palm since last 10-12 months. On clinical examination circumferential constricting scar with granulation tissue could be seen around the wrist and two discharging sinuses were noted along its palmar aspect. Radiograph wrist was done which showed a circumferential soft tissue density with constriction in the wrist region. Ultrasound revealed a trilayered circumferential band around the wrist, superficial to the tendons. Surgical exploration revealed a rubber band protruding from granulation tissue/discharging sinus at palmar aspect of wrist, band was removed and follow up examination done at 1 and 3 months showed no neurovascular compromise. A high clinical suspicion is required to make this diagnosis and ultrasound as a single modality is enough in making the diagnosis of rubber band syndrome.

Keywords: Younger children, constriction band, surgical correlation, radiograph, ultrasound.

I. Introduction

Rubber band syndrome is a very rare condition due to forgotten band around various body parts leading to complications. This condition is described in younger children with only one such known case in adults. When this band is worn for long duration especially during the age of rapid growth, the band penetrates through the skin and subcutaneous tissue to lie within soft tissue with re-epithelisation of skin over the band making it invisible.

Case Report

A 3 year old male child presented with complaint of swelling in the left distal forearm, wrist and palm since last 10-12 months. On clinical examination palm and fingers were swollen, however no e/o any bluish discoloration noted. Circumferential constricting scar with granulation tissue could be seen around the wrist (fig 1a) and two discharging sinuses were noted along its palmar aspect (fig 1b).

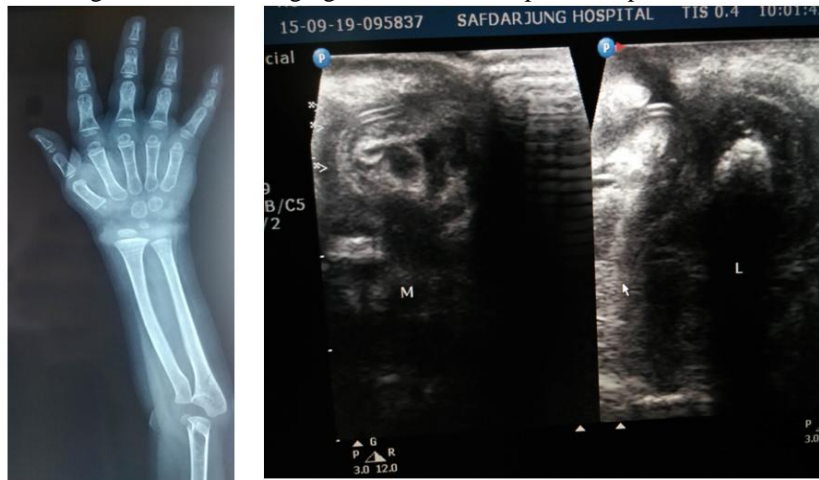
Radiograph wrist was done which showed a circumferential soft tissue density with constriction in the wrist region with normal appearing bones (fig 2a). Ultrasound wrist of the patient showed a tri-layered echogenic circumferential band with central hypo-echogenicity, superficial to the tendons in the deep soft tissue of wrist, except at two focal spots on the palmar aspect where the band appears most superficial in the region of the two discharging sinuses (fig 2b). On Doppler evaluation, normal arterial velocity and waveform were noted at wrist and hand. On detailed and insistent inquiry the mother recalled an incident where the child's elder sibling had put a rubber band around his wrist and the mother does not remember removing it.

Surgical exploration of wrist was performed and it showed a rubber band protruding from granulation tissue/discharging sinus at palmar aspect of wrist, rubber band was seen sliding over and encircling entire circumference of the wrist with no e/o any adhesion. Band was cut and removed in toto from the site of protrusion on palmar aspect of wrist (fig 3). Follow-up examination done after 1 and 3 months, showed no e/o any neurovascular compromise.



Fig 1a – Circumferential scar around the wrist

Fig 1b –Two discharging sinus around the palmar aspect of wrist



2a. Circumferential Soft tissue thickening of wrist on radiograph

2b. Tri-layered echogenic band on ultrasound



3. Constricting scar with discharging sinus with protruding rubber band

II. Discussion

Very few studies have described circumferential foreign body of the limbs(1-5),the first study regarding rubber band constriction of thigh was reported by kumar et al in 1995(1)who stated that due to rapid growth and increase in circumference of wrist the thread cut through the soft tissue, this gradual process is surprisingly painless.(1) Similar finding and progression was noted in our case. These elastic band pose different constrictive effects on limbs depending on their thickness and tensile strength(6)and produce inherent heat on stretching, and coolness on relaxing, making the rubber band gradually breach the skin and remain in the planes of the limbs depending upon the place and its position.(7) Subsequently skin epithelise over the band and it is covered by circumferential scar mark on the surface.(6) Radiographs may be helpful in leading to diagnosis but usually at later stage when constriction sign due to bony involvement can be appreciated.(3)MRI also aids in establishing diagnosis preoperatively.(8)

III. Conclusion

A high index of suspicion is required to diagnose and manage such cases and in our study we also highlight that ultrasound as a single modality is sufficient in making diagnosis as well as in assessing complications in these cases.

Bibliography

- [1]. Kumar P, Kumar B, Singh K (1995) A constriction ring of the thigh secondary to a rubber band. *Plastic and Reconstructive Surgery*. 95: 209-10.
- [2]. Rasool MN, Stathoulis B (1996) Rubber band constriction of the wrist. *J Hand Surg Br*. Dec; 21(6): 806-7.
- [3]. Arora A, Agarwal A (2004) Dhaga syndrome: a previously undescribed entity. *J Bone Joint Surg Br*. 86B: 282-84.
- [4]. Aggarwal AN, Kini SG, Arora A, Singh AP, Gupta S, Gulati D (2010) Rubber band syndrome- high accuracy of clinical diagnosis. *J PaediatrOrthop*, Oct-Nov; 30(7): e1-4.
- [5]. Swarup GC (1991) Progressive constriction band caused by blackmagic thread. *J Hand Surg* 16B:349
- [6]. McIver, MandisaAnjail MD, Gochman et al (2011) Elastic band onthe wrist: a not So “silly” complication. *PediatrEmerg Care* 27(5):428-429

- [7]. Dr. Gaurav Garg¹, Dr. Tarunika Gupta², Dr. V.K. Pande³. Circumferential Embedded Foreign Body: Diagnosis Requires A High Index of Clinical Suspicion; IOSR Journal of Dental and Medical Sciences (IOSR-JDMS): 2279-0853, p-ISSN: 2279-0861. Volume 14, Issue 6 Ver. II (Jun. 2015), PP 102-103.
- [8]. Kumaraswamy Mohan Kumar & M. Shankarappa "Rubber Band Syndrome of the Arm"; J Hand Microsurg (July–December 2013) 5(2):83 DOI 10.1007/s12593-013-0092-4
- [9]. Agarwal A, Kant KS, Verma I (2013); The rubber band syndrome : the forgotten band in the wrist. Hand surg. 18(3): 407-10. doi:10.1142/S0218810413720258