CASE REPORT

The "POPEYE SIGN" – A Classical but Rare Case

Maznun Mat Jidin[1], Sakinah Md Riffin[2], Shaiful Ehsan Shalihin[3]

[1] Klinik Kesihatan Triang, 28300 Teriang, Pahang
[2] Klinik Kesihatan Bandar 32, 28300 Bera, Pahang
[3] Department of Family Medicine, Kulliyyah of Medicine, International Islamic University Malaysia, Bandar Indera Mahkota Campus, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang

ABSTRACT

Isolated biceps tendon rupture is rarely reported at primary care level. A 78-year-old man presented with deformity over his right mid arm for one week, following a low impact trauma over his right shoulder six weeks prior. Physical examination revealed the classical sign of rupture of the long head of biceps tendon (LHBT) which showed bulging of his right biceps muscle, resembling the famous cartoon character, "Popeye The Sailorman". Diagnosis of rupture of LHBT was made in the primary care clinic without the need of imaging modality based on the identification of the "Popeye Sign". Diagnosis and condition have been explained well to patient and caretaker without the need for inappropriate investigation and procedures. Conservative treatment approach was opted. His condition was stable without new active complaints on subsequent follow up. This case proved that stable ruptures of LHBT are still possible to be managed at primary care level.

Keywords: Popeye sign, long head biceps tendon (LHBT)

Corresponding Author:
Maznun Mat Jidin, MMed (Family Med)
Email: nun85@yahoo.com
Tel: +609-2555333

INTRODUCTION

Biceps tendon rupture is not an uncommon ligamentous injury. Clayton and Court Brown reported that the incidence of biceps tendon rupture was 0.5 per 100 000 population per year(1). Male to female ratio was 3:1 while the mean age was 60 for male and 67.5 for female (1). It typically occurs in the background of tendon degeneration in a frail elderly man, but the injury may also occur among young athletes during sports competition (2). The biceps tendons consist of two proximal tendons which are the long head of biceps tendon (LHBT) and the short head of biceps tendon (2). Rupture of LHBT usually occurs among middle-aged people, who present with a sudden contraction of the biceps muscle, with many of them describing a "pop" sound(3). They almost always occur near the tendon attachment site at the humerus shaft or near the proximal intertubercular groove (3). Patient commonly complained of swelling, weakness and pain of the affected arm following the injury (2). Typically, thorough clinical examination would be able to visualize the bulging mass over the upper arm(3). Therefore, the diagnosis is usually made clinically without requiring imaging studies unless concomitant bone fracture, joint dislocation or subluxation is suspected(3). Though a non-surgical approach is usually opted, surgical intervention is available for certain patients and conditions especially in young men and occurs in the dominant hand (2). The post-surgery prognosis is variable depending on the extent of the injury. Conservative management especially in elderly patients is justifiable and patients require physiotherapy for muscle strengthening (3).

CASE REPORT

A 78-year-old man, with underlying hypertension and hyperlipidemia, presented to the primary care clinic with swelling over his right arm for one week. The swelling was painless and had no skin discolouration. He denied having any fever or any joint pain. He had no constitutional symptoms such as weight loss or reduced appetite. Six weeks prior to the swelling, he had a low impact fall and unintentionally hit his right shoulder onto the ground. He sustained minor soft tissue injury and was treated conservatively with a right arm sling. There was no shoulder fracture or dislocation. There is also no swelling over his right arm during the injury. He did not notice any abnormal "popping" or snapping sound prior to the swelling. However, he did not have any loss of function of his right arm.

On general examination, the patient was well without septic looking. He was afebrile and his vital signs were stable. There was swelling at his middle right arm measuring 4cm x 5 cm. There were no skin changes. The swelling was not warm and not tender. Its consistency

was soft to firm. He had a full range of active and passive motion of his right shoulder and right elbow. There was no right shoulder swelling or tenderness. His left arm appeared normal with absence of similar swelling. The picture of the deformity is shown in Figure 1.

The patient was treated conservatively as the condition did not disturb his function and there was no concern on cosmetic appearance. On subsequent follow up, his condition was stable without any new complaints.

Figure 1: The picture showed the classical sign of rupture of the long head of bicep tendon (LHBT) also known as "Popeye sign"

DISCUSSION

Musculoskeletal problems are commonly encountered in the emergency unit as well as in the primary care setting. B. Wiitavaara et al.(2017) reported that the prevalence of musculoskeletal disorders was 60% in the primary health care settings in Sweden(4). It is a fact that primary care physicians are often sought initially for musculoskeletal injuries and disorders(5). Therefore, detailed and focused clinical assessments are important to determine whether there is a need for further radiological investigations or referral to the emergency unit.

Nevertheless, after a comprehensive assessment, most of the common musculoskeletal injuries and problems can be managed in the primary care setting without the need of further investigations (5). This assessment includes having clinical knowledge of certain rare but classical signs of injuries or disorders that point towards the clinical diagnosis without objecting the patients to a series of investigations and procedures. This case report showed an example of the clinical sign of the rupture of the long head of the biceps tendon which is also known as the "Popeye sign".

The anatomy of the biceps brachii muscle is unique. The biceps brachii muscle consists of two tendons proximally(2). The long head of biceps tendon (LBHT) originates from the supraglenoid tubercle and posterosuperior labrum, while the short head originates from the coracoid process (2). These two muscle bellies then combine into one bicep muscle at the deltoid insertion (2). The function of LHBT is still not completely understood (2). Previously, it was thought that it plays a role in maintaining superior stability of the glenohumeral joint of the shoulder (3). However, the electromyographic studies (EMG) revealed no passive role of either proximal biceps tendons in the glenohumeral stability (2). Meanwhile, the distal bicep tendon serves as the primary supinator and secondary flexor of the elbow (3).

Proximal biceps tendon injury comprises more than 90% of biceps tendon rupture in which rupture of LHBT are more common than rupture of the short head of biceps tendon(3). The risk factor and mechanism of injury associated with rupture of LHBT are degenerative changes in the elderly, traumatic changes in younger patients that arise from heavy weightlifting, sudden extension of the arm, and repetitive arm motion(3). In this case, the risk factor of our patient was old age and prior history of trauma. He may have degenerative changes over the LHBT and the rupture may be precipitated by the preceded trauma (3).

Following the injury, a palpable soft tissue lump would be present over the mid upper arm that resembles hypertrophied biceps muscle, also known as Popeye sign or deformity (3). Nevertheless, this classical sign does not always occur after the injury. The patients may get surprised and concerned about the swelling that made them seek medical treatment, like what happened to our patient. Other clinical features that may present such as acute pain prior to rupture and relief following injury and ecchymoses(3) which are not present in our patient. Loss of function of the biceps muscles rarely occurs due to the intact short head of biceps tendon (3). Diagnosis is done clinically and can be supplemented with imaging such as ultrasound and MRI to distinguish between partial or complete tears of LHBT (3). However, neither imaging modalities are required to make a diagnosis (3). Treatment is mainly conservative and non-surgical (3). If a non-surgical approach is chosen, the residual cosmetic deformity may persist and the patient may have cramping on strenuous activity (3). Surgical repair may be performed in younger, athletic patients or for cosmesis reasons (3). Biceps tenodesis is the most common treatment for surgical approach (3). Our patient was diagnosed clinically and underwent conservative treatment in view of his age and no loss of function. His condition noted significant improvement on our follow up without any new complaints. The algorithm below in Figure 2 showed the suggested management approach of biceps muscle injury at primary care (3).

Older populations more than 60 years of age tend to have underdiagnosed and neglected musculoskeletal injury due to their fragility, lack of physical activity and undernutrition. Furthermore, some of them may stay

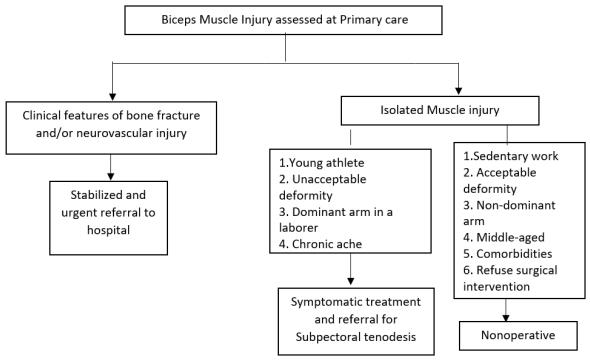

Figure 4: Algorithm for the approach of biceps muscle injury at primary care (Adapted from Geaney & Mazzocca, 2010)

alone without good family support with an underlying low level of education. Therefore, among important learning points that can be highlighted from this case includes the necessity of adequate systematic review and general examination of the elderly who came for any visit for any reason. They might not be able to describe in detail for each complaint, but it is important for the clinician to identify the complaints, reassure, educate and manage the problems adequately. This report proved that an individualized and holistic approach of assessment pertaining to musculoskeletal complaints can prevent unnecessary and bothersome investigation that may add more burden and emotional distress to the elderly. At least, adequate and appropriate follow up should be given to the elderly in case there is no referral to tertiary centres.

CONCLUSION

This case highlights the clinical importance of knowing Popeye sign in primary care. This sign is classical for rupture of LHBT and a spot diagnosis could be made without the need of imaging modality. In many circumstances, the patient can be treated conservatively in the primary care clinic unless the needs for surgical repair arise such as in young athletes or for cosmetic purposes. Hence, money and time could be saved.

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