

**Original Research Article****Selfie Elbow-Latest Tech Injury**Priyanka Chugh^{1*}, Rahul Sharma², Tabish Fahim³

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ABSTRACT

Selfie taking is emerging as an avid sport in which everyone can participate and share self-portraits with the world. And like any other sport, it too has its share of injuries. Although it is too early to comment on the excessive use of the elbow or thumb while clicking a selfie, there is always a possibility that by incorrect stretching of the tendons, an injury can be caused to joints like the elbow. Recently, award-winning US journalist and NBC's Today show host Hoda Kotb was diagnosed with this new lifestyle condition. Like tennis elbow or golfer's elbow, an addiction to selfie-taking can cause a pain in your primary pic-snapping elbow and the day is not too far when you hear or read about an Indian teenager spotted with this condition. Selfie elbow is more of an abnormal and repetitive loading of muscles around elbow, leading to micro ruptures which cause inflammation and pain. This ultimately heals with scarring and causes recurrent pain. Even minimal stress can initiate severe pain in your elbow. This leads to painful inhibition of muscles resulting in further weakening. This builds up a vicious cycle and severe loss of function. So, it is suggested that the selfie-taking habit should be kept at a reasonable level to avoid such a condition.

1. Introduction

Oxford dictionary defined Selfie as, "A photograph that one has taken of oneself, typically one taken with a Smartphone or webcam and shared via social media"[1]. Before the rise of this selfie concept, smart phones or social media, the thought of taking self portraits was existed among people with using self-timers on the cameras. The idea behind the selfie meant to be different than using a self timer, and also it should not take a longer snapping time process as self timer. Most importantly to be a selfie, photograph should be captured with a camera held at arm's length or focused at a mirror[2].

Initially popular with young people, selfies gained wider popularity over time[3,4]. By the end of 2012, Time magazine considered selfie one of the "top 10 buzzwords" of that year; although selfies had existed long before, it was in 2012 that the term "really hit the big time"[5]. According to a 2013 survey, two-thirds of Australian women age 18–35 take selfies—the most common purpose for which is posting on Facebook[4].

A poll commissioned by smartphone and camera maker Samsung found that selfies make up 30% of the photos taken by people aged 18–24[6].

Selfies have been popular on social media.⁷ Instagram has over 53 million photos tagged with the hashtag #selfie. The word "selfie" was mentioned in Facebook status updates over 368,000 times during a one-week period in October 2013.

During the same period on Twitter, the hashtag #selfie was used in more than 150,000 tweets[8].

Recently, award-winning US journalist and NBC's Today show host Hoda Kotb was diagnosed with this new lifestyle condition. Like tennis elbow or golfer's elbow, an addiction to selfie-taking can cause a pain in your primary pic-snapping elbow and the day is not too far when you hear or read about an Indian teenager spotted with this condition, experts say[9].

"Selfie taking is emerging as an avid sport in which everyone can participate and share self-portraits with the world. And like any other sport, it too has its share of injuries," Dr. Dhananjay Gupta, Director (Bone and Joints) at Fortis Flt Lt. Rajan Dhall Hospital, told IANS.

Clicking too many selfies will affect upper limb, elbow and shoulder muscles which automatically will lead to functions getting degraded. "A working person suffering from this might have to take off for a few weeks as clicking too many selfies is a major health hazard," added Dr. Nishchal Chugh, Director (Joint Replacement) at Saroj Super Speciality Hospital[9].

"Although it is too early to comment on the excessive use of the elbow or thumb while clicking a selfie, there is always a possibility that by incorrect stretching of the tendons, an injury can be caused to joints like the elbow," noted Dr. Raman Kant Aggarwal, Director (Shoulder Surgery Department) at Fortis Bone and Joint Institute. "Selfie elbow is more of an abnormal

and repetitive loading of muscles around elbow, leading to micro ruptures which cause inflammation and pain. This ultimately heals with scarring and causes recurrent pain," Gupta said[9].

Even minimal stress can initiate severe pain in your elbow. This leads to painful inhibition of muscles resulting in further weakening. "This builds up a vicious cycle and severe loss of function," Gupta stated. From gaming and chatting to selfie-taking, texting and tweeting, there has been a greater rise in injuries in teenagers than ever before. Experts suggest that the selfie-taking habit should be kept at a reasonable level to avoid such a condition[9]. "Basically, the interface between technology and the human body sometimes causes injuries of over-exuberance," Jordan Metzl, sports medicine physician at the Hospital for Special Surgery in the US, was quoted as saying in a Cosmopolitan report. The problem is simply overuse.

"You get selfie elbow from taking too many selfies, as you put too much stress on the muscle and it irritates the area where the muscle comes off the bone and you get this inflammatory response," Metzl added. From gaming and chatting to selfie-taking, texting and tweeting, there has been a significant rise in injuries in teenagers than before. Tendonitis occurs when the tendon becomes inflamed, while carpal tunnel is caused by the compression of the median nerve in the wrist, usually due to overuse of the hand[10].

Doctors told the magazine that more patients have come to them for tech-related injuries.

Earlier, doctors saw cases of 'Blackberry thumb', from overuse of the smart phone. The 'iPad hand' is another manifestation of such overuse. Gaming for long hours has also caused tendonitis."You get tennis elbow from playing too much tennis-or having poor form-and you get selfie elbow from taking too many selfies," said Dr Jordan Metzl, a sports medicine physician at New York's Hospital for Special Surgery. "You put too much stress on the muscle and it irritates the area where the muscle comes off the bone[10]."

Keeping your arm raised for long periods to click selfies puts your elbow muscles under severe strain. Repeating the same action eventually makes the elbow muscles swell and puts pressure on the bone, leading to inflammation and excruciating pain, say doctors. Any abnormal posture is going to put bone and muscles under stress. Taking selfies involves an unusual arm position and repeating the act could be injurious, cautioned orthopaedist Rajeev Chatterjee. "A growing number of youngsters are being afflicted with the condition. Since taking selfies is a new fad, the number of patients will rise," he added. While frequent gaming, chatting or texting on the cellphone can lead to similar condition, selfies could hasten the injury since it involves raising the arm, said experts. "A bent elbow with the palm pointing inward is enough to put pressure on the elbow extensor muscles. It eventually leads to tendinitis which causes the swelling and pain," said Ayan Roy, consultant orthopaedic surgeon at CMRI Hospital[11].

Ameet Pispati, consultant orthopaedic surgeon at Jaslok Hospital & Research Centre, has seen at least "15 such cases in the last three months". Dr. Pispati explains: "A group of

muscles start at the elbow, travels down the forearm and goes across the wrist. When the elbow is outstretched with the shoulder up and the wrist bent, that combination can put a lot of load on the muscles. Going into that position repeatedly can lead to swelling of the muscles and eventually micro tears leading to long-term pain." But attributing the pain entirely to selfies might be an "over exaggeration" contends Kaushal Malhan, consultant joint replacement surgeon, Fortis Mulund."It's another contributing factor to injuries that extreme use of the cell phone like constant texting and gaming can cause[12].

1.1 Why people click selfie?

Selfies are immensely popular these days. Millions of selfies have been posted on various social networking sites (Unmetric, 2014)[13]. They have become a new medium for self-expression and self-representation. "By posting selfies, people can keep themselves in other people's Minds. In addition, like all photographs that are posted online, selfies are used to convey a particular impression of oneself"[14].

1.3 Consequences of taking selfie

The American Psychiatric Association (APA) has officially confirmed what many people thought all along: taking 'selfies' is a mental disorder. The APA made this classification during its annual board of directors meeting in Chicago. The disorder is called selfitis, and is defined as the obsessive compulsive desire to take photos of one's self and post them on social media as a way to make up for the lack of self-esteem and to fill a gap in intimacy[15].

When people take their photos of day to day activities and try to share with all of their friends and also invite them to become part of this social media. Initially starting with fun and time-pass gradually it becomes habit and then addiction. The main motive behind this seems to be exposure of the self-esteem and to show off (pseudo show-off) among the society that they are doing something great which release their stress and depression and makes them feel good. Youth is becoming technology-addicted and selfie-obsessed and is currently undergoing therapy for OCD and Body Dysmorphic Disorder (an excessive anxiety about personal appearance)[16].

1.4 Health Consequences

Clicking numerous selfies may lead to orthopaedics complication such as pain in elbow, now a day's known as "The Selfie Elbow" due to prolonged use of arm and hand in awkward posture

1.5 Anatomy

The stability of the elbow joint is provided by the bony anatomy and the ligaments, which are actually specialized thickenings of the joint capsule[19]. The radial (lateral) collateral ligament is commonly described as originating from the lateral epicondyle and terminating diffusely in the annular ligament[18]. The radial collateral ligament originates at the lateral epicondyle and attaches distally by blending into the annular ligament. The lateral ulnar collateral ligament arises posterior to the radial collateral ligament and passes superficial to the annular ligament to attach to a discrete bony

tubercle on the proximal ulna. Originating from the lateral inferior aspect of the lateral epicondyle, the extensor carpi radialis brevis origin is the most lateral of the extensor group. The extensor carpi radialis brevis is covered by the extensor carpi radialis longus and its fibers are almost indistinguishable from those of the extensor carpi radialis longus and extensor digitorum communis in most cases. The extensor carpi radialis brevis muscle also has additional attachments to the radial collateral ligament and the intermuscular septa between it and the common extensor muscles[19]. The extensor carpi radialis brevis tendon inserts to the dorsal surface of the base of the third metacarpal bone. Pure wrist extension with some assistance in radial deviation is the main functions of the extensor carpi radialis brevis. Electromyographic studies by Kashiwagi[20] showed the extensor carpi radialis brevis contracted strenuously at all times during daily functional activities.

1.6 Pathophysiology

Tenderness is typically localized to the tendinous origin of the extensor carpi radialis brevis. The pain can be aggravated by gripping, heavy lifting, as observed in holding cell phones for long time by extended arm. Chronic symptoms are commonly associated with inadequate muscle power and endurance. Most investigators contend that repetitive and cumulative injury produces this condition. The consequent force overload may be due to factors localized at the elbow (intrinsic) or the result of factors acting at a distance from the elbow (extrinsic).

Intrinsic factors appear to be the most causal factors[21] and occur when there is excessive loading of normal musculoskeletal tissue. Overexertion of the extensor muscles of the wrist as a result of repeated gripping and twisting (i.e., supination/pronation) movements may occur prior to the onset of symptoms. Cyriax[22] and La-Freniere[21] report that these forceful contractions lead to irritation and partial tears of the involved musculature.

These repetitive high moments of force are beyond the adaptive capacity of the tissue with subsequent deterioration occurring[23]. The site of tissue degeneration continues to be somewhat controversial, although the extensive work by Goldie[24], noted previously in this review, and has done much to clarify the nature of the lesion. Cyriax[22] theorized that a muscle tears most easily at its attachment to the bone rather than at the musculotendinous junction or the muscle belly. He stated that the site of maximal tenderness is the site of the injury. However Garrett et al.[25] state that muscle damage always occurs at the musculotendinous junction. Kivi[26] proposed that the connective tissue plays an important role. While muscle fibers are well supplied with blood and have good healing potential, the tendon fibers attached to the periosteum are relatively avascular and tend to heal more slowly. Lesions are characterized by macroscopic and microscopic tears, which may be superficial or deep. Microscopically, avulsion fractures and round cell infiltration may be present. Scattered foci of fine calcification and scar tissue with marginal areas of cystic degeneration and fibrinoid degeneration may be evident in some cases[27]. Repair is often by immature granulation tissue, but rupture of the extensor carpi radialis brevis tendon is rare.

1.7 Signs & Symptoms

The arm is painless at rest and during passive range of motion. With repeated microtrauma, an inflammatory condition of the periosteum may develop, which can lead to formation of granulation tissue and adhesions. Granulation tissue contains a large number of free nerve endings which may be responsible for increased tenderness to palpation[22,27] The tenderness is most notable at the anterior aspect of the lateral epicondyle and the lateral forearm. Palpation of the radial collateral ligament may elicit exquisite tenderness and is usually increased with varus (adduction) stress to the elbow. Grip strength may be decreased, but the articular and neurological signs are normal. In severe cases, pain at rest occurs along with varying decreases of motion at the extremes of flexion and extension. According to Bosworth[28] it is difficult to determine whether the extensor muscle origin or the annular ligament is responsible for the symptoms, as they are firmly attached to each other. He contends that rotation of the radial head beneath these structures during pronation and supination causes trauma. This movement produces a pulsating effect, which can cause a stenosis and fibrosis of the annular ligament and the extensor origin. Cyriax[22] and Leach and Miller[29] both concur with this explanation. In most cases, the lesion will involve the junctional tissue at the common extensor muscle origin of the lateral epicondyle, specifically, the extensor carpi radialis brevis[21,22,26,27,28]. If the extensor carpi radialis brevis is involved, extension of the wrist will be more painful if resistance is given at the heads of the metacarpals rather than at the fingertips[22]. Radial extension will more specifically indicate the extensor carpi radialis brevis or extensor carpi radialis longus. Pain with resisted extension of the middle finger is present when the extensor carpi radialis brevis is involved[27] Tenderness above the epicondyle will indicate that the extensor Tenderness above the epicondyle will indicate that the extensor carpi radialis longus is involved, while anterolateral tenderness would arise from extensor carpi radialis brevis tissue inflammation. Ulnar extension will provoke the extensor carpi ulnaris. Radial and ulnar extension involve the extensor digitorum communis, but most authors agree that involvement of the extensor digitorum communis or the extensor carpi ulnaris is rare[22,28]. The onset of pain is usually gradual. The force generated by muscle contraction may not produce pain until healing has begun and there is some adhesion between the tendon and the inflamed periosteum[22]. Tendons may heal in a somewhat lengthened position, forcing intact muscles to absorb a greater amount of the strain. Other simple diagnostic tests can include the forced elbow extension test, which is usually positive. The forearm is held fully pronated and the wrist palmarly flexed; passive elbow extension then produces lateral elbow pain, which may limit full extension of the joint. Grip limited by pain, as measured by dynamometry, has been shown to be yet another reliable and sensitive index of irritability among patients with lateral epicondylitis[30].

1.8 Treatment

Therapeutic eccentric exercise (TEE) has been found to be an effective intervention for a variety of tendinopathies[31]. It has been suggested that eccentric exercise effectively "lengthened" the muscle-tendon complex resulting in structural remodeling of the tendon with hypertrophy and

increased tensile strength of the tendon[32]. Eccentric exercise may also provide neuromuscular benefits through central adaptation of both agonist and antagonist muscles[33]; therefore, TEE may provide both a structural and functional benefit during tendinopathy rehabilitation. Interestingly, some patients with LE exhibit lowered pain pressure thresholds (PPT) and larger referred pain patterns than would occur solely due to the presence of trigger points, suggesting a central nervous system mediation of pain[34].

Rest is the first line of defense against this condition, because the “Selfie Elbow” is an overuse injury, the first practical action would be to stop clicking Selfies until the pain is gone. Anything, within reason, that causes the pain to become stronger or more intense, should be avoided. Continuing clicking numerous Selfies will only make the problem worse.

1.9 Icing

Icing will work only if the condition is inflammatory. Cases dominated by muscle dysfunction will not respond, especially well to ice. Ice is recommended for its local vasoconstrictive and analgesic effect. Experts recommend it to do it every 20-30 min every 3 hourly or 2-3 days or until the pain is gone[35].

2.0 Therapeutic ultrasound

According to survey of orthopedic certified specialist, the most common use is for where to decrease soft tissue inflammation, increase tissue extensibility, enhance scar tissue remodeling, increase soft tissue healing, decrease pain and decrease soft tissue swelling[36,37].

2.1 Muscle strengthening program

The muscle strengthening program was initially proposed by Dr. Ernest W. Johnson (oral communication, October 2003), an American physiatrist from Ohio State University in Columbus. The program encompasses a 10 repetition maximum of eccentric and concentric movements of the wrist extensor muscles in two different positions: First with the elbow flexed to 90°, then with the elbow extended to 180°. The forearm is pronated in both positions. Slow full wrist extensions are followed by slow full wrist flexion; each full wrist extension and full wrist flexion should take 5-10 s. A “10 repetition maximum” means that it is difficult (or impossible) to do more than 10 repetitions with a given weight (handheld dumbbell). It is normal for pain to be present while performing the exercises. The weight is progressively increased when 10 repetitions can be completed without pain[36,38].

"For those who are dedicated selfie-takers, using a selfie stick can work like an arm extender and takes the pressure off the elbow," suggested Charles Kim, musculoskeletal rehab specialist at Rusk Rehabilitation at NYU Langone Medical Center in the US[39].

“SEPTUM” i.e. **S**elfie **E**lbow **P**revention & **T**reatment **U**nimpeachable **M**ethods have been devised for preventing and treating “Selfie Elbow”.

Table No. 1: SEPTUM: Selfie Elbow Prevention & Treatment Unimpeachable Methods

Prevention	
1.	Avoid – Refrain yourself from taking selfies & Groupies
2.	Restrain the number - Limit the number of selfies being clicked
3.	Pre selfie stretches – Stretch wrist extensor and flexors Muscles prior to clicking selfies
4.	Alternate the arms – Keep Switching your arm to prevent over stress
5.	Use bilateral arms - Prefer using both arms instead of overusing dominant arm
6.	Selfie stick - Prefer using selfie stick instead of extending your elbow
7.	Avoid prolonged posture maintainence – Keep changing your posture
Treatment	
1.	Rest - Refrain from Clicking Selfies and Groupies
2.	Icing – Apply Ice on lateral epicondyle, or lateral side of your elbow
3.	Stretching – Stretch the wrist flexor and extensors muscles
4.	Strengthening – Strengthen the muscles surrounding elbow joint
5.	Topical ointment - Apply topical analgesic as painful part
6.	Analgesics – Take oral Analgesics as prescribed by orthopaedician Eg. Ibuprofen(NSAID)

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