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The Application of Echo-guided Injection of Steroid and Botulinum Toxin Type A for Ankle Contracture in Traumatic Trans-metatarsal Amputation: A casereport

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病例報告

應用超音波導引注射類固醇及肉毒桿菌素治療外傷性蹠骨截肢合併馬蹄足內翻變形之病歷報告

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本病例為外傷性截肢的病患。在常規的復健治療下還是有出現髖關節攣縮及踝關節馬蹄足內翻而需使用輔助器步行。經骨科醫師轉介後先以肌電圖排除腓神經性損傷後，並以超音波導引下注射類固醇於髂腰肌並在踝關節前室抽吸積水，另外將類固醇注射於足後跟滑囊及脛後肌肌腱低迴音病灶。注射後踝關節蹠曲角度從 30 度變為 20 度，髖關節屈曲角度從 15 度變 0 度，兩天後施予肉毒桿菌治療注射於左側腓腸肌內外肌，比目魚肌，脛後肌，屈趾短肌。注射後踝關節回到中立位置，接受復健訓練後病患可自行獨立行走。（台灣復健醫誌 2022；50(1)：53 - 58）

關鍵詞：應用超音波導引注射(echo guide injection)，外傷性截肢(traumaticjoint amputation)，肉毒桿菌素治療(botulinum toxin type A injection)，足踝攣縮(ankle contracture)

前　言

外傷導致的截肢雖然比糖尿病足的截肢少見，但是病患族群相對年輕所以術後的復健與職能的恢復也顯的格外重要。通常會經過多次清創手術與皮瓣修復手術，所以皮瓣處的傷口的攣縮與多次清創手術後造成的疼痛與臥床也可能是造成病患日後無法正常行走的原因。

病　例

本篇報導病例為 21 歲男性，在工作時候遭到水泥塊掉落壓傷左腳，經過多次清創與接受蹠趾關節截肢(metatarsophalangeal joint amputation) (圖 1)並使用左大腿的皮瓣補皮。補皮後在常規的復健治療後仍存有馬蹄足外翻， 導致步態受到嚴重影響(圖 2、圖 3)。經照會骨科、建議以 Z-Plasty 手術來延長阿基里斯肌腱，但病患已經經過多次手術所以希望保守治療為優先考量。

因此先用肌電圖檢查來排除了腓神經(peroneal nerve)損傷，另外應用超音波檢視髂腰肌發現有大範圍低迴音現象，踝關節前室(anterior recesses)積水，足後跟滑囊(retrocalcaneal bursa)與脛後肌肌腱(tibialis posterior tendon)低迴音病灶。治療前踝關節之活動度：蹠屈角度為 30 度，內翻角度為 30 度，髖關節屈曲角度 16 度。在治療方面，以超音波導引下注射類固醇於髂腰肌，在踝關節前室抽出 3c.c.積水，另外將類固醇注射於足後跟滑(retrocalcaneal bursitis)及脛後肌肌腱(tibialis posterior tendon)低迴音病灶。注射後關節活動度馬上獲得改善，蹠屈角度由 30 度降為 20 度，內翻角度由 30 度降為 20 度，髖關節屈曲角度由 15 度降為 0 度。兩天後再施予肉毒桿菌注射於左側腓腸肌內外側頭(gastrocnemius lateral/medial head)100U，比目魚肌(soleus)100U，脛後肌(tibialis posterior muscle)50U，屈趾短肌(flexor digitorum brevis muscle) 50U。在治療一週後病人可用四腳枴獨立站立與步行(圖 4、圖 5)，垂足角度為 0 度，內翻角度為 5 度，注

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射治療後病患接受步行療並接受肌肉電刺激於注射部位與脛前肌。另外給予踝上型足部輔具，讓病人接受步行訓練，3 週後即不需要枴杖便可以獨立步行。

討　論

馬蹄足內翻可分爲先天的原因如腦性麻痺或後天由中風或腦部外傷所造成的後遺症，肉毒桿菌治療對與上述神經病變所造成的馬蹄足內翻有相當顯著的成果。目前對於截肢術後所造成的足部變形的文章相對少見。[1]

導致馬蹄足內翻的原因有很多，主要由小腿肌痙攣，小腿三頭肌-阿基里斯肌腱縮短，足背屈肌無力或不平衡導致。[2]在肉毒桿菌注射後若可以及早復健和接受神經肌肉電刺能有助於增加肉毒桿菌注射的效果。[3]

但是對於由小腿三頭肌-阿基里斯肌腱(triceps surae-Achilles tendon complex)縮短，足背屈肌無力與腓骨肌-脛骨前肌失調的個案效果並沒有特別的顯著，[2]通常都會藉由手術來改善。目前肉毒桿菌注射治療對於神經性攣縮的改善已經有實證依據，但對於外傷導致的變形是否進而使步態得到改善並沒有確切的答案。[4]

隨著超音波解析度不斷的提高，藉由超音波檢查軟組織的損傷變得更爲清晰明確， 經由超音波導引下注射治療，注射治療位置更爲精確，配合肉毒桿菌的應用和足部輔具的使用，可以有效改善病患之關節攣縮合併變形進而改善步態。[5]

圖 1. 右爲術後足部 X-Ray；蹠趾關節截肢(metatarsophalangeal joint amputation)

圖 2. 爲截肢與最後一次清創術後

圖 3. 病人在接受治療前用只能使用助行器行走，且患肢無法踩地

圖 4. 注射治療後住院受訓練，一週後可使用四腳枴進獨立行走（正面）

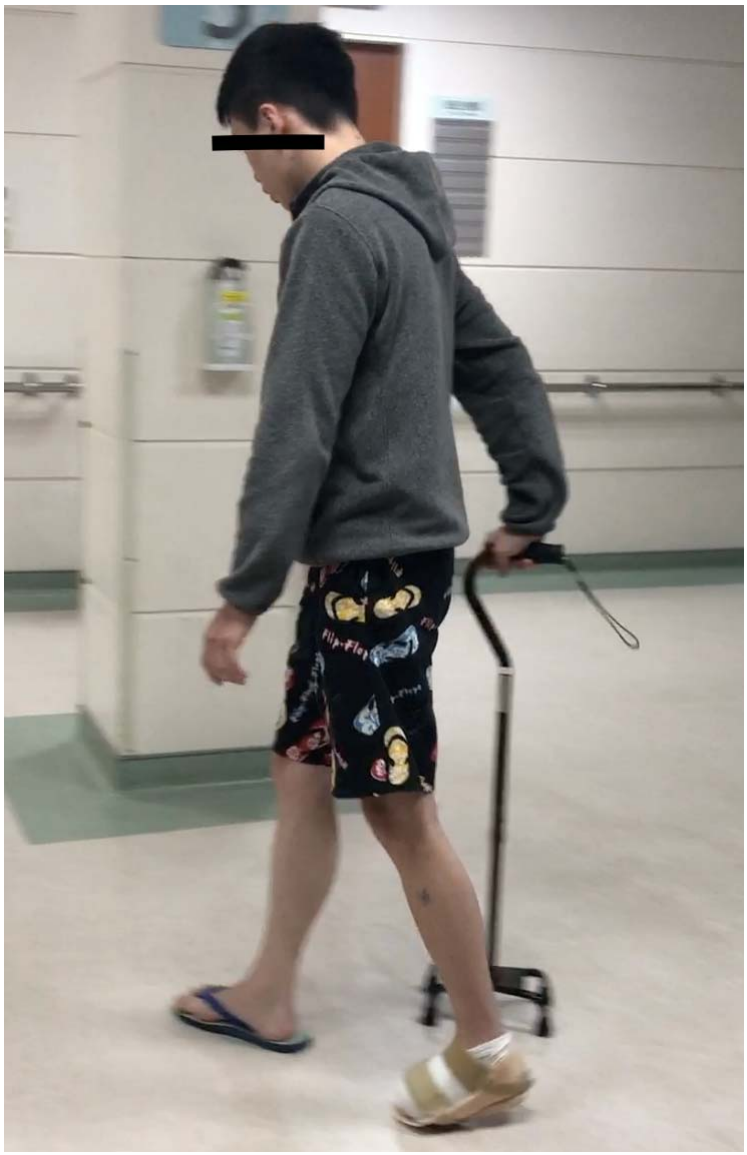

圖 5. 注射治療後住院受訓練，一週後可使用四腳枴進獨立行走（側面）

結　論

超音波導引下使用類固醇注射治療對於改善術後肌肉痙攣有部分的效果，再加上肉毒桿菌注射治療進一步改善攣縮有顯著的效果，由本個案得知合併使用類固醇與肉毒桿菌治療能有效改善外傷性馬蹄組內翻。

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The Application of Echo-guided Injection of Steroid and Botulinum Toxin Type A for Ankle Contracture in Traumatic Trans-metatarsal Amputation: A Case Report

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In this report we share 21 year-old young man with traumatic transmetatarsal amputation treated with multiple operations after few weeks of surgery. Foot equinovarus deformity was noted which leads to walking disability and affects daily activities. Patient was referred to us from orthopedic doctor because he hesitated to have another operation for Achilles tendon lengthening. During the physical examination, equinovarus foot with hip contracture were observed which may be caused by muscle imbalance or nerve injury. Nerve conduction velocity and electromyography tests (NCV/EMG) was arranged for differentiating between neurogenic contraction and myogenic contracture.

Peroneal nerve injury was ruled outafter the NCV/EMG examination, sonography was used to check for the presence of muscle lesions. Hip joint tapping with echo-guided local injection of steroids was performed for hip flexion contracture. Hip joint flexion contracture was improved from 15 degree to 0degree. And the left ankle ultrasound examination revealed effusion over anterior recesses, thickening of retrocalcaneal bursa and hypoechoic changes over tibialis posterior tendon. Afterecho-guided ankle joint tapping with steroid injection, ankle plantar contracture was improved from 30 degree to 20 degree. And then we calculated the required dose of botulinum toxin A (BTA) and injected it into the left gastrocnemius lateral/medial head, soleus, tibialis posterior muscle, flexor digitorum brevis muscleusing sonographic guidance. An ankle could return to its neutral position. After 3 weeks of ambulation training with supra malleolar orthosis he could walk independently. In summary, combined use of echo-guided injection of steroid and BTA, ankle contracture can be restored. (Tw J Phys Med Rehabil 2022; 50(1): 53 - 58)

Key Words: echo guide injection, traumatic join amputation, botulinum toxin type A injection, ankle contracture

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