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(CASE REPORT)

Foot drop following total hip arthroplasty: Rehabilitation after tibialis posterior transfer: A case report

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Abstract

Foot drop Following total hip arthroplasty represents a rare but severe neurological complication, with significant impact on gait and autonomy. Tibialis posterior transfer is a recognized therapeutic option for persistent deficits, provided it is followed by structured rehabilitation aimed at functional recovery. The objective of this work is to report the case of a 62-year-old patient admitted to physical medicine and rehabilitation after tendon transfer for foot drop following right total hip arthroplasty, and to emphasize the importance of adapted rehabilitative management.

Keywords: Foot drop; Total hip arthroplasty; Common peroneal nerve injury; Tibialis posterior tendon transfer; Tendon transfer rehabilitation; Neurological complications

1. Introduction

Neurological injuries following total hip arthroplasty are uncommon, yet they remain among the most functionally disabling complications.

Foot drop most commonly reflects injury to the fibular (peroneal) component, responsible for impossibility or marked weakness of ankle dorsiflexion, resulting in steppage gait, impaired foot clearance during walking, and high risk of falls. When spontaneous neurological recovery is insufficient, tibialis posterior transfer may be proposed to restore useful active dorsiflexion and improve gait. In this setting, physical medicine and rehabilitation plays a central role in motor relearning of the transferred tendon, joint recovery, and locomotion retraining.

2. Materials and Methods

This work reports the case of a 62-year-old patient followed for bilateral coxarthrosis and arterial hypertension, with a surgical history of tendon transfer following neurological complication of a right total hip arthroplasty. She had previously undergone bilateral total hip arthroplasty, with the right prosthesis complicated by paralytic foot drop with impossibility of active dorsiflexion, preventing return to walking. After persistence of the deficit, a tibialis posterior transfer was performed, followed by plaster immobilization for six weeks, then referral to a physical medicine and rehabilitation service.

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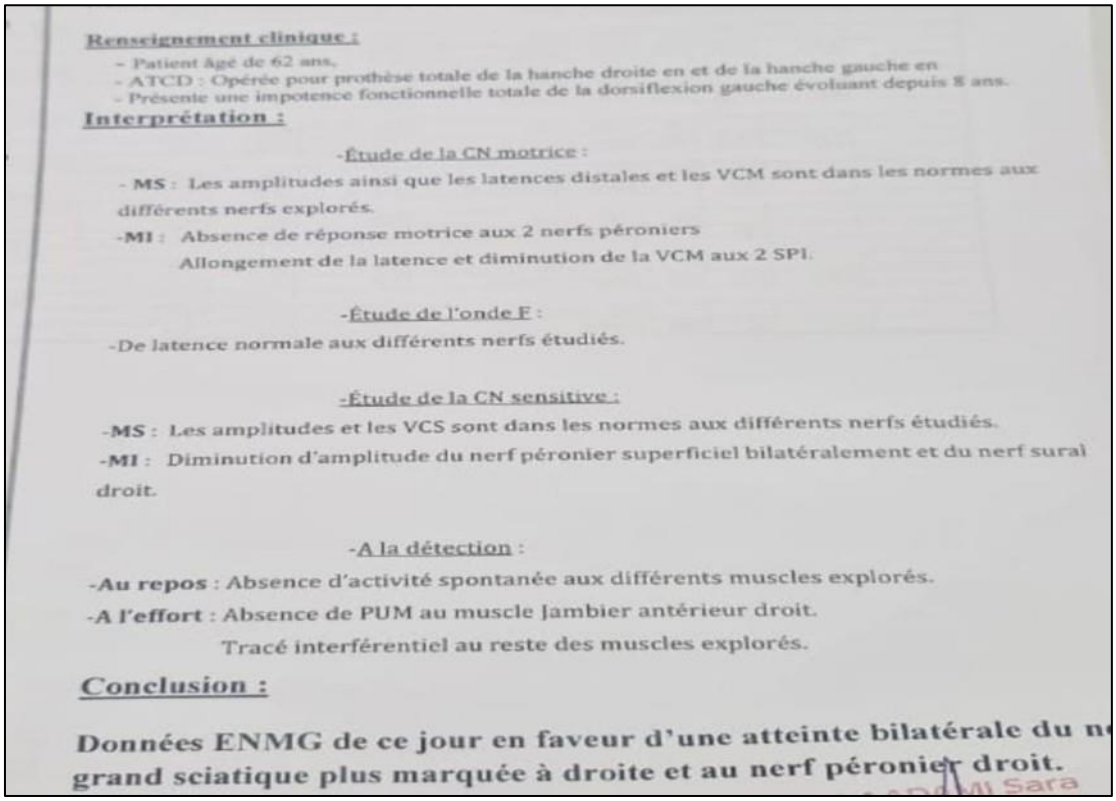
Initial clinical evaluation was based on history taking, locomotor examination, trophic and scar inspection, and functional analysis. The objectives of management were progressive recovery of ankle mobility, motor relearning of the transferred tendon, and return to functional gait.

The rehabilitation program was designed according to principles described after tendon transfer for foot drop, with cautious progression after plaster removal, adapted mobilization, analytical work, progressive strengthening, proprioceptive retraining, and supervised return to walking.

3. Results

Upon admission, clinical examination revealed limitation of dorsiflexion and plantar flexion of the right ankle, without joint limitation at the hip level. Inspection revealed amyotrophy of the anterolateral compartment of the leg, compatible with functional impairment of dorsiflexor and evertor muscles. Skin examination showed a postero-lateral surgical scar from total hip arthroplasty, as well as a scar at the foot level related to tendon transfer.

From a functional perspective, these clinical abnormalities were integrated into a postoperative foot drop syndrome responsible for major difficulty in resuming walking. The absence of hip limitation represented a favorable element for locomotor recovery, allowing rehabilitative work centered on the ankle, balance, and gait pattern. The surgical scars required regular skin and trophic monitoring during the management process.



Renseignement clinique :

- Patient âgé de 62 ans.
- ATCD : Opérée pour prothèse totale de la hanche droite en et de la hanche gauche en
- Présente une impotence fonctionnelle totale de la dorsiflexion gauche évoluant depuis 8 ans.

Interprétation :

-Étude de la CN motrice :

- **MS :** Les amplitudes ainsi que les latences distales et les VCM sont dans les normes aux différents nerfs explorés.
- **MI :** Absence de réponse motrice aux 2 nerfs péroniers
  Allongement de la latence et diminution de la VCM aux 2 SPI.

-Étude de l'onde F :

-De latence normale aux différents nerfs étudiés.

-Étude de la CN sensitive :

-**MS :** Les amplitudes et les VCS sont dans les normes aux différents nerfs étudiés.
-**MI :** Diminution d'amplitude du nerf péronier superficiel bilatéralement et du nerf sural droit.

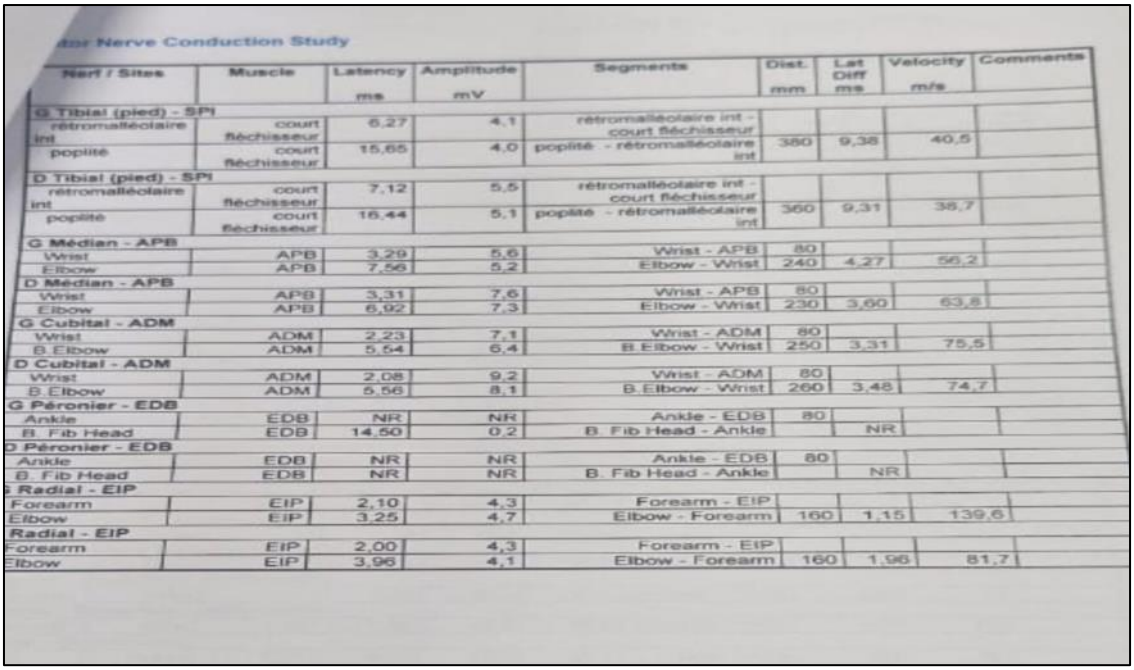
-A la détection :

-**Au repos** : Absence d'activité spontanée aux différents muscles explorés.
-**A l'effort** : Absence de PUM au muscle Jambier antérieur droit.
Tracé interférentiel au reste des muscles explorés.

Conclusion :

Données ENMG de ce jour en faveur d'une atteinte bilatérale du n
grand sciatique plus marquée à droite et au nerf péronier droit.

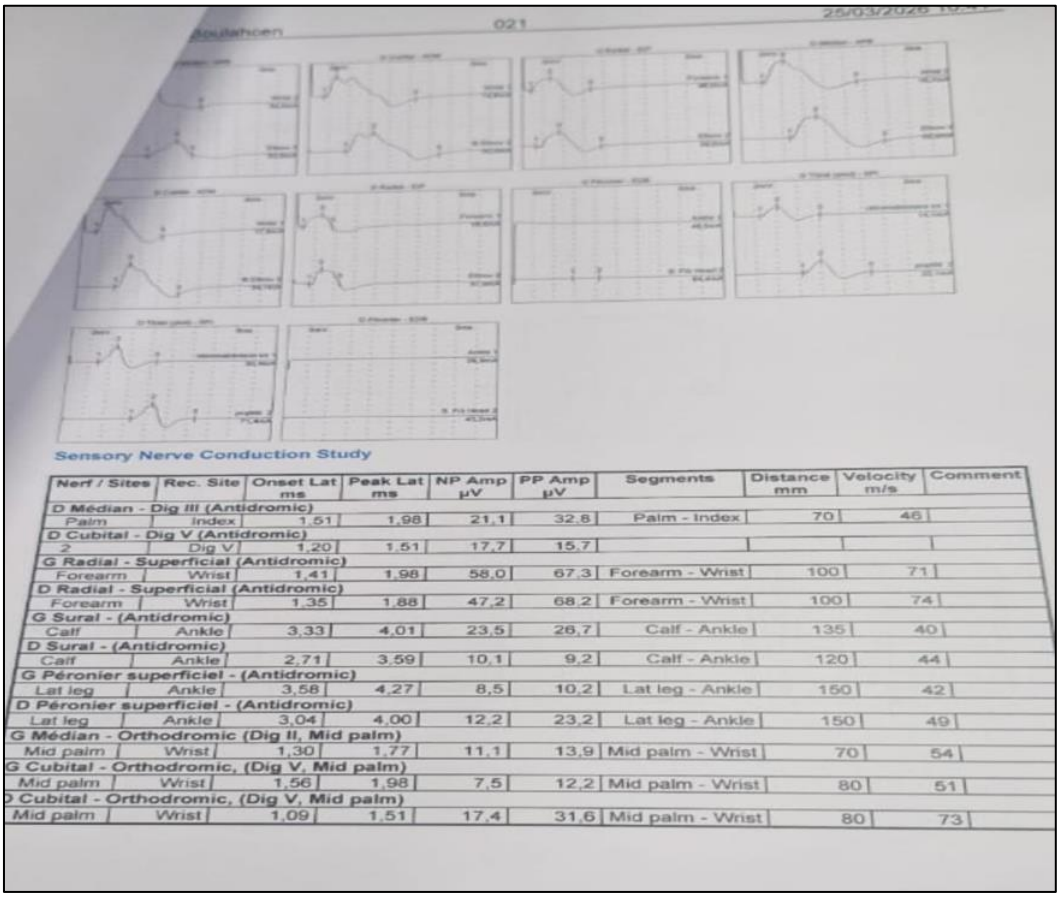
Figure 1 Electroneuromyography report detailing the clinical findings, the results of motor and sensory nerve conduction studies, F-wave analysis, and needle EMG, concluding bilateral involvement of the sciatic nerve, more pronounced on the right, with paralysis of the right peroneal nerve



Motor Nerve Conduction Study

Nerf / Sites	Muscle	Latency ms	Amplitude mV	Segments	Dist. mm	Lat Diff ms	Velocity m/s	Comments
G Tibial (pied) - SPI								
rétromalléolaire int	court fléchisseur	6,27	4,1	rétromalléolaire int - court fléchisseur				
poplité	court fléchisseur	15,65	4,0	poplité - rétromalléolaire int	380	9,38	40,5	
D Tibial (pied) - SPI								
rétromalléolaire int	court fléchisseur	7,12	5,5	rétromalléolaire int - court fléchisseur				
poplité	court fléchisseur	16,44	5,1	poplité - rétromalléolaire int	360	9,31	38,7	
G Médian - APB								
Wrist	APB	3,29	5,6	Wrist - APB	80			
Elbow	APB	7,56	5,2	Elbow - Wrist	240	4,27	56,2	
D Médian - APB								
Wrist	APB	3,31	7,6	Wrist - APB	80			
Elbow	APB	6,92	7,3	Elbow - Wrist	230	3,60	63,8	
G Cubital - ADM								
Wrist	ADM	2,23	7,1	Wrist - ADM	80			
B.Elbow	ADM	5,54	6,4	B.Elbow - Wrist	250	3,31	75,5	
D Cubital - ADM								
Wrist	ADM	2,08	9,2	Wrist - ADM	80			
B.Elbow	ADM	5,56	8,1	B.Elbow - Wrist	260	3,48	74,7	
G Péronier - EDB								
Ankle	EDB	NR	NR	Ankle - EDB	80			
B. Fib Head	EDB	14,50	0,2	B. Fib Head - Ankle		NR		
D Péronier - EDB								
Ankle	EDB	NR	NR	Ankle - EDB	80			
B. Fib Head	EDB	NR	NR	B. Fib Head - Ankle		NR		
Radial - EIP								
Forearm	EIP	2,10	4,3	Forearm - EIP				
Elbow	EIP	3,25	4,7	Elbow - Forearm	160	1,15	139,6	
Radial - EIP								
Forearm	EIP	2,00	4,3	Forearm - EIP				
Elbow	EIP	3,96	4,1	Elbow - Forearm	160	1,96	81,7	

Figure 2 Motor nerve conduction study: table of motor parameters of upper and lower limb nerves, showi marked abnormalities of the common peroneal nerve consistent with foot drop



Sensory Nerve Conduction Study

Nerf / Sites	Rec. Site	Onset Lat ms	Peak Lat ms	NP Amp µV	PP Amp µV	Segments	Distance mm	Velocity m/s	Comment
D Médian - Dig III (Antidromic)									
Palm	Index	1,51	1,98	21,1	32,8	Palm - Index	70	46	
D Cubital - Dig V (Antidromic)									
2	Dig V	1,20	1,51	17,7	15,7				
G Radial - Superficial (Antidromic)									
Forearm	Wrist	1,41	1,98	58,0	67,3	Forearm - Wrist	100	71	
D Radial - Superficial (Antidromic)									
Forearm	Wrist	1,35	1,88	47,2	68,2	Forearm - Wrist	100	74	
G Sural - (Antidromic)									
Calf	Ankle	3,33	4,01	23,5	26,7	Calf - Ankle	135	40	
D Sural - (Antidromic)									
Calf	Ankle	2,71	3,59	10,1	9,2	Calf - Ankle	120	44	
G Péronier superficiel - (Antidromic)									
Lat leg	Ankle	3,58	4,27	8,5	10,2	Lat leg - Ankle	150	42	
D Péronier superficiel - (Antidromic)									
Lat leg	Ankle	3,04	4,00	12,2	23,2	Lat leg - Ankle	150	49	
G Médian - Orthodromic (Dig II, Mid palm)									
Mid palm	Wrist	1,30	1,77	11,1	13,9	Mid palm - Wrist	70	54	
G Cubital - Orthodromic, (Dig V, Mid palm)									
Mid palm	Wrist	1,56	1,98	7,5	12,2	Mid palm - Wrist	80	51	
D Cubital - Orthodromic, (Dig V, Mid palm)									
Mid palm	Wrist	1,09	1,51	17,4	31,6	Mid palm - Wrist	80	73	

Figure 3 Multisegmental sensory nerve conduction study showing sensory potential waveforms and a table of latencies, amplitudes, and conduction velocities of the median, radial, ulnar, sural, and common peroneal nerves

4. Discussion

Recent large series confirm that foot drop following PTH is rare, with an incidence of 0.44% in a series of primary surgeries and around 0.3% in a large contemporary database . Our observation therefore falls within the context of a rare complication, but it differs in that the deficit has been present for an exceptionally long time, which significantly worsens the distal functional prognosis. From an epidemiological perspective, some studies identify female gender, certain acetabular anomalies, revision surgery, and spinal comorbidities as factors associated with a higher risk of post-PTH foot drop. In our case, the patient is female, which aligns with one of the described risk factors; however, the other factors detailed in the published series are not documented in the available clinical record .The pathophysiological mechanisms reported in the literature primarily include nerve traction, compression by a hematoma or foreign body, and focal structural lesions. Imaging studies have shown that an immediately onset foot drop is more consistent with nerve traction, whereas a delayed onset may suggest a localized focal cause. In our case, ENMG confirmed severe peripheral nerve involvement, but the absence of nerve imaging data or a detailed intraoperative timeline does not allow for a definitive retrospective determination of the exact mechanism. In terms of prognosis, the literature shows that complete recovery is achieved only in a variable proportion of cases; some series report complete recovery in 53.2% of patients at one year, while others cite overall rates of complete recovery ranging from 16% to 56%, depending on the initial severity and type of injury. In contrast, our patient has had a deficit that has been progressing for eight years, with muscle atrophy and an absence of motor unit potentials in the right anterior tibial nerve, indicating a much more severe and much longer-standing condition than in the majority of standard postoperative case series. This discrepancy explains the change in therapeutic strategy. While some recent postoperative neuropathies may be managed through monitoring, etiological investigation, or sometimes a targeted intervention depending on the mechanism, a long-standing chronic paralysis primarily requires a strategy of functional compensation. In our case, the decision to perform a tendon transfer therefore appears consistent with the absence of spontaneous recovery and the chronic nature of the condition The posterior tibial tendon transfer is widely described as the standard palliative treatment for chronic dorsiflexor deficiency. The objectives reported in the literature are similar to those sought in our patient: to restore functional dorsiflexion, achieve a plantigrade foot, limit steppage, and reduce dependence on ortheses. The functional outcomes published following tendon transfer are generally encouraging, but they must be interpreted in light of the etiological context. In a retrospective series of patients who underwent surgery for post-traumatic equinus foot via anterior transfer of the posterior tibial tendon, mean active dorsiflexion improved from -31° to +8°, with a significant improvement in AOFAS and FAOS scores, and a return to plantigrade or taligrade gait in 83.3% of patients. In another longer-term study, the peripheral population exhibited active dorsiflexion visible during walking in 66.7% of cases, with reported weaning from orthotic use in all patients studied. By comparison, our case remains in the early postoperative stage following immobilization, without resumption of weight-bearing or a true assessment of gait, which does not yet allow us to evaluate the ultimate functional benefit of the transfer. Unlike the series reported in the literature, where outcomes are assessed at a later time following rehabilitation, our observation takes place at a time when priorities still focus on sitting up, weight-bearing, and the prevention of secondary complications.

Postoperative rehabilitation is, in fact, a key point of comparison with the literature. Published protocols emphasize the importance of joint maintenance, stretching, transfer training, proximal muscle strengthening, learning the new motor pattern of the transferred tendon, and progressive gait retraining. The goals set for our patient closely align with these recommendations: prevention of equinus, maintenance of range of motion, proximal exercises, improvement of weight-shifting, gradual standing, occupational therapy, and orthotics. Orthotic use also remains an important point of comparison. Although some studies report frequent discontinuation of the orthosis after posterior tibial nerve transfer, this goal cannot be considered an immediate one for our patient, given her current inability to walk and the still early stage of her postoperative evaluation. The right foot elevator therefore continues, at this stage, to provide functional stabilization consistent with the principles of rehabilitation.

Finally, our case highlights that the primary goal is not necessarily complete neurological recovery, but rather achieving a realistic level of functional improvement. While the literature often reports outcomes in terms of active dorsiflexion, weaning from an orthosis, or functional scores, this patient's situation immediately requires a different prioritization: safe transfer, sitting upright, regaining weight-bearing, preventing equinus, and gradually rebuilding ambulation with an orthosis . This comparison clearly shows that expected outcomes must always be interpreted in light of the stage of progression and the initial severity of the deficit

5. Conclusion

Foot drop following total hip replacement is a disabling complication whose management may require a posterior tibial nerve transfer followed by specialized rehabilitation. In this case, the limited dorsiflexion and plantar flexion, muscle

atrophy in the anterolateral compartment, and the absence of hip joint involvement pointed toward a program focused on the ankle and gait. The key takeaway is that functional recovery after tendon transfer depends not only on the surgical procedure itself but also on a progressive, individualized rehabilitation program focused on independent mobility.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest among authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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