FROM THE ORTHOPAEDIC CLINIC, BORÅS
(HEAD: DOCENT FOLKE STAHL)

HOW OFTEN DO THE NEUROLOGICAL SIGNS DISAPPEAR AFTER THE OPERATION OF A HERNIATED DISC?

By

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This problem received attention from *Waris* in 1948. He reported on 56 patients, in whom the Achilles tendon reflex had disappeared completely, and found on review 1 to 5 years after the operation that the reflex returned to normal strength in 12 (21.4 %). In 5 cases (8.9 %) a weak Achilles tendon reflex was demonstrable, while in 39 (69.6 %), the loss of the reflex was permanent.

The Achilles tendon reflex was weak in 18 cases before the operation: in 2 (11.1 %) of them the reflex could not be elicited at all at the review, 8 (44.4 %) still had a weak reflex and in 8 (44.4 %) it was normal.

Waris found also that in 2 cases a complete paresis of the dorsal extensors of the great toe had disappeared by the re-examination. 15 patients with weakness of the extensors of the great toe were followed up and in 10 (66.6 %), the extensors recovered normal strength and in 5 (33.3 %) slight weakness persisted.

As to impairment of sensibility *Waris* stated that the symptom persisted unchanged in 38.7 % in his material of 137 patients, who had the symptom before operation.

At the review he observed no atrophy except in those cases with definite muscle weakness.

2 years earlier (1946) *Friberg & Hirsch* reviewed 44 patients, who had been operated upon at least 5 years previously. They found regression of the impairment of sensibility in 42.4 %, but they never found any recovery of the Achilles tendon reflex.

One of them (*Friberg* 1941) had found on review of 24 patients that in 3 of them, in whom the patellar reflex was weak before the operation, this was normal at the review. Two of these three patients showed a

weakened Achilles tendon reflex before operation, but in those patients the reflex had also become normal by the time of review. In one patient the Achilles tendon reflex was also normal at the review instead of weakened before operation. *Friberg* thus observed recovery of a weakened reflex in 4 patients.

In 1946 *Senning & Sjöqvist* reported recovery of the Achilles tendon reflex after complete loss in 11 cases. They also found that paresis of the extensors of the great toe usually disappeared within a very short time after operation, but in some few cases it persisted for many years.

Three years later (1949) *Rövig* wrote: "It is emphasized that neurological changes, such as disturbance of the motor and sensory systems and also change in reflexes due to root lesion, may persist for years after the compression has been removed".

Another orthopaedic surgeon *O'Connel* (1950) found persistent reflex changes in 62 %, persistent muscular weakness in 6.6 % and persistent impairment of sensibility in 30 % and atrophy in 8.4 % at review.

The literature for the rest contains very scanty data on persistence or disappearance of neurological signs and symptoms. The first to discuss this point were *Alajouanine & Peiti-Dutaillis* (1913), and the claimed that one should not except too much of the possibilities of regeneration. The same year, however, *Towne & Reichert* described a case with loss of Achilles tendon reflex and marked impairment of sensibility and 16 months after operation the reflex and sensibility was normal. *Howard Brown* (1937) and *Spurling, Mayfield & Rogers* (1939) also presented 7 and 6 patients respectively where a disappeared reflex returned to normal after operation.

TABLE 1

	Before operation		At the review		
	Weakened	Absent	Normal	Weakened	Absent
Achilles tendon reflex ...		40	1	5	34
	69		18	40	11
Patellar reflex		4			4
	29		1	28	
	Paresis	Paralysis	Normal	Paresis	Paralysis
Strength in the extensor		13	3	4	6
of the great toe	110		84	26	

As it would seem the data among this question in the literature are very scanty and contradictory.

Therefore, the author has made a fairly thorough examination of the patients (who were operated in a 2-years period) before and 1 year after the operation.

The results are summarized in table 1.

It is clear from table 1 that of 40 patients with loss of the Achilles tendon reflex before operation, the reflex was still absent at the review in 34 (85 %), while in 5 (12.5 %) it had returned but was still weak. Only in 1 patient (2.5 %) had the reflex returned to normal.

In 69 cases the Achilles tendon reflex was weakened before operation, and at the review the reflex was still weak in 40 (58 %), in 11 (15.9 %) it could not be elicited, and in 18 (26.1 %) it had returned to normal.

As to the patellar reflex it was found that in 4 patients in whom the patellar reflex was absent before operation, it was unchanged at the review.

Of the 29 patellar reflexes, which were weak before operation, one was normal at the review, while the 28 were unchanged.

13 of the patients had paralysis of the extensors of the great toe before operation. At the review 6 (46.2 %) still had paralysis, 4 (30.8 %) showed weakness of the muscle strength, and 3 (23 %) had returned to normal strength of the toe.

84 patients (76.4 %) of 110 with weakness of the gross strength of the extensors of the great toe before operation had at the review normal strength, while it was still reduced in the remaining 26 (23.6 %).

In table 2 you will find in those cases where the neurological signs changed after operation how long the symptoms had persisted before operation was done.

Loss of sensibility was at the review noted to remain in 67.2 % and muscular atrophy in 75.6 %.

It must thus be concluded that with the exception of weakness of the dorsal extensors of the great toe, the neurological signs persist to a high degree unchanged at least one year after the removal of the root compression.

A comparative study was made with the electromyographic findings, and therefore all these patients were examined electromyographically (Method; see *Knutsson,* 1959) before the operation and one year after the operation. And thereby it was found that at the preoperative examination, 185 patients showed electromyographic changes showing

root compression, against only 42 (22.7 %) after operation, and in 5 (2.7 %) there were persisting electromyographic changes in a single muscle. The electromyographic findings thus tend to disappear in a greater percentage than the clinical neurological signs after the removal of a root compression.

TABLE 2

Before operation	After operation	Operative find.	Duration of symptoms
Neurological sign	Neurological sign		
Achilles tendon reflex absent 40	Achilles tendon reflex normal 1	Herniated disc	4 months
	Achilles tendon reflex weakened 5	Herniated discs	2–5 m. mean: 3 m.
Achilles tendon reflex weakened 69	Achiller tendon reflex normal 18	Positive disc changes 17	1–20 m. mean: 5.8 m.
		Negative expl. 1	3 m.
Patellar reflex weakened 29	Patellar reflex normal 1	Herniated disc	8 m.
Paralysis of the extensors of the great toe 13	Normal strength in the extensors of the great toe 3	Herniated discs	3 m. mean: 3 m.
	Paresis of the extensor of the great toe 4	Herniated discs	1–4 m. mean: 2 m.
Paresis of the extensor of the great toe 110	Normal strength in the extensor of the great toe 84	Positive disc changes 80	1–10 m. mean: 4 m.
		Negative expl. 4	1.5–4 m. mean: 2.8 m.

SUMMARY

An account of a review of patients one year after the operation for herniated disc-syndrome with special reference to the disappearance of the clinical and electromyographic signs is given. It was found that the electromyographic changes regressed considerably after operation while the clinical-neurological signs with the exception of weakness of the great toe persisted in a high degree.

RESUME

Il est rendu compte de l'examen de malades un an après qu'ils aient été opérés pour un syndrome d'hernie discale en se référant particulièrement à la disparition des signes cliniques et électromyographiques. Il a été découvert que les modifications électromyographiques diminuent considérablement après l'opération tandis que les signes cliniques neurologiques, à l'exception de la faiblesse dans le gros orteil, persistent à un haut degré.

ZUSAMMENFASSUNG

Ein Bericht über die Durchuntersuchung von Patienten ein Jahr nach der Operation wegen Scheibenprolapssyndromes unter besonderem Hinweis auf das Verschwinden klinischer und elektromyographischer Zeichen wird gegeben. Man fandt, dass die elektromyographischen Veränderungen nach der Operation bedeutend zurückgingen, während die klinisch-neurologischen Zeichen, mit Ausnahme der Schwäche der grossen Zehe, zumeist bestehend blieben.

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