Introduction

*Algodystrophy syndrome* is a term which encompasses a wide clinical specter and is closely related to posttraumatic reflex dystrophy, posttraumatic sympathetic dystrophy, algoneurodystrophy, shoulder-arm syndrome, ostheneurodystrophy and a causalgic syndrome (fig.1, 2) [3, 9].

Algodystrophy is thought to be caused by combining an exogenous factor (circulatory insufficiency or failure, swelling, painful and traumatic fracture repositioning, frequent repositions, poor bone ingrowth, etc), with a predisposing endogenous background (neuropsychological lability, hormonal imbalance, degenerative illnesses, high blood pressure, diabetes, etc.) [3,5]. An X-ray scan reveals an ongoing spotty decalcification of the bone, most clearly visible around the fractures in the wrist area (fig. 3).

X-ray changes follow clinical manifestations with a slight delay. The clinical process consists of three stages [3, 12] – acute inflammation, chronic inflammation and a dystrophy stage. Different treatments are proscribed depending on the stage of the illness – physiotherapeutic procedures [5], analgesics, vasodilators, neuroleptics, Calcitonin, intravenous regional sympathetic blockades, ganglionic block [8].

**Aim**

The aim of this study is to show the effect of a complex drug and physiotherapeutic treatment for treatment of patients with algodystrophy syndrome after a distal radius fracture.

**Materials and Methods**

The study is based on 106 patients with distal radius fracture, 48 of which have developed the M. Zudeck complication. The complex treatment therapy of patients with the complication includes drug treatment with Calcitonin under the supervision of a rheumatology doctor and a physiotherapeutic program which is conducted every day for a period of 10 days, with 3-5 therapeutic courses over the course of 4-6 months. The program consists of [4]:

- Underwater gymnastics – a local bathtub with water at 34°C
- Kinesitherapy [8]
- Occupational therapy [1, 2, 10, 11]
- Low Frequency Magnetic Field (LFMF) – 15 – 20 min., 2 A, 1 – 100 Hz
- Interferential currents (IFC) – 5 min. 90 – 100 Hz ; 10 min. 1 – 100 Hz

All patients had initial and final measurements and tests taken according to a specifically created individual patient file, which includes: VAS test for the pain, goniometry, manual muscle test (MMT), hand grip test [4], and a daily activities life test (DAL) [6, 7].

**Results**

Algodystrophy patients endure a strong, “burning” pain (20 points),
which frequently is consistent and unaffected by drug treatments. Figure 4 shows the results of VAS tests for pain, comparing the results of patients without complications with the results of patients who developed the algodystrophy syndrome. The median test result values at the beginning and end of the observed period were used for the comparison.

When measuring the joint movement volumes and the presence of an edema at the radio-ulnar and wrist joints and hypotrophy of the muscles of the forearm, the results were similar.

Figure 5 shows the Wilcoxon curves for restoring DAL abilities at the end of the rehabilitation process for patients with and without algodystrophy. The curve of patients without algodystrophy or complications is on the right, which indicates better rehabilitation results after a distal radius fracture. The results of the hand functionality and hand grip tests are similar.

Figure 6 presents the duration of the recovery period for patients with and without algodystrophy after a distal radius fracture. The data shows a significantly longer rehabilitation process for patients with M. Zudeck complication, as well as a longer immobilization period (measured in months) compared to patients without complications.

**Implications**

1. 42.45% of all patients included in the study developed algodystrophy,
which is a serious problem and requires a prolonged rehabilitation process and Calcitonin treatment.

2. The applied rehabilitation program has shown to significantly influence the rehabilitation process in a positive way for patients who have developed Zudeck’s algodystrophy syndrome after a distal radius fracture.

3. When performing DAL activities, patients with Zudeck dystrophy face bigger difficulties, they recover more slowly and to a lesser extent than patients without the syndrome.

4. Analysis of the study results proves that a complex approach is required for treatment of posttraumatic conditions of the forearm for patients with algodystrophy syndrome.

Conclusions

The results and the clinical experience gained from the study give us reason to conclude that a positive effect from the complex drug and physiotherapy treatment is observed on all measured indicators for patients with Zudeck algodystrophy after a distal radius fracture, regardless of the patients’ age or sex.

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Fig. 6. Duration of the rehabilitation period for patients after distal radius fracture (measured in months)