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# Self-injection injury during vaccination of salmon

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## SHORT CASE REPORT

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**A fish vaccinator accidentally injected a dose of vaccine into his left thumb. After the acute symptoms had subsided, he had prolonged pain and reduced function of the hand. It is important that doctors know how these injuries should be treated, in order to avoid serious complications.**

A man in his forties was assessed at an occupational outpatient clinic due to pain and reduced function in his left arm. The symptoms had arisen after he suffered an accident at work three months earlier in connection with manual vaccination of fish. He had been using a syringe with a protective ring, but nevertheless the syringe slipped and hit his thumb. The entire dose of 0.05 ml salmon vaccine was injected. The patient believes that the cannula entered the interphalangeal joint.

The accident occurred early in the morning. In accordance with the company's procedures in cases of self-injection, he took Naproxen immediately afterwards. He telephoned a local doctor, but the doctor concerned did not consider that any intervention was needed. In the course of the evening the finger became swollen, red and inflamed (Figure 1). A red stripe then appeared up his arm with swelling in the axilla, and he felt unwell during the evening and the same night. Three days after the accident, upon returning home the patient contacted his GP. The GP suspected possible erysipelas, prescribed antibiotics and placed him on sick leave. The visible reactions disappeared within approximately 14 days. However, he had prolonged symptoms of pain and reduced strength in his hand, as well as periodic numbness of the fingers. He remained on long-term sick leave from work.



**Figure 1** Reaction around the injection site following an accident at work while vaccinating fish.

At the first examination at the outpatient clinic, inspection of the hands yielded normal findings, as well as normal, equal bilateral mobility of the thumb and wrist joints. There was good, bilaterally equal muscle fullness in the axillae and normal sensitivity in both hands. However, both Tinel's sign test and Phalen's test of the left hand gave positive results. This raised suspicion of carpal tunnel syndrome. A hand dynamometer test revealed significantly reduced strength on the left side compared with the right.

He was referred for MR neurography and orthopaedic assessment. Neurography showed no evidence of either carpal tunnel syndrome or ulnar nerve involvement. The orthopaedic examination revealed no objective findings that could explain his symptoms. The orthopaedist recommended an anti-inflammatory drug with a view to reducing any possible oedema surrounding the nerves. The patient was also given a wrist brace to use at night and a support bandage which he used in the daytime. In addition, he received advice on exercises from a physiotherapist.

He gradually improved in the time that followed. Approximately six months after the accident he went back to work, but only performed automatic vaccination procedures. A new examination after around nine months found good movement in the wrist and interphalangeal joints, and no sign of swelling. His hand grip strength had also somewhat improved. One month later he contacted us again due to changes in his left thumb. It transpired that the pulp of his thumb tip had atrophied (Figure 2).



**Figure 2** Atrophied pulp approx. ten months after self-injection injury in the thumb during vaccination of fish.

At the final examination, more than one year after the accident, he was working full-time. He says that this is largely due to proper support and facilitation by his employer. He has still not regained normal strength in his left hand, and he reported reduced sensation in his thumb. This has resulted in limitations in the tasks he can perform at work. He still does not undertake manual vaccination of fish.

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## Discussion

In the last 40 years, aquaculture has become one of Norway's most important industries. This also entails some challenges, one of the most significant of which is fish diseases. In order to prevent such diseases, extensive vaccination of salmon and other farmed fish is undertaken. Today, much of the vaccination is performed automatically using vaccination machines, but a large proportion of fish are still vaccinated manually. When manual vaccination is performed, the fish are held, one by one, in the hand and the vaccine is injected into the fish's abdomen (Figure 3). Vaccination takes place at high speed, and an operator can vaccinate up to 25 000 fish in one day. The normal dose is 0.05–0.1 ml. The syringes used are equipped with a protective ring to reduce the risk of self-injection, and gloves are used to ensure a good grip. The vaccines are mineral oil-based, with the addition of formalin-inactivated bacteria and/or viral antigens.



**Figure 3** Manual vaccination of salmon. Photo: Pharmaq

The oils used in fish vaccines have high tissue toxicity, and injection can lead to toxic oedema with necrosis and, in the worst case, loss of all or parts of the finger (1, 2). It is therefore essential that all cases of self-injection be assessed by a doctor. Where all or most of the dose is injected into the hand or finger, the patient must be assessed by a surgeon as rapidly as possible with a view to incision and rinsing. If the needle has only caused a scratch, treatment other than with painkillers and anti-inflammatory drugs can be deferred, but the patient must be instructed to contact the doctor again if nausea, lethargy or fever occur (1, 2). Self-injection does not usually result in infection, and antibiotics are thus seldom indicated (1, 3).

In the present case report, there were no signs of necrosis in the acute phase, but the subsequent atrophy of the pulp indicates tissue damage. We have no definitive explanation for why the patient had such prolonged pain, but it is possible that oedema surrounding the nerves may have been a contributory factor. His reduced hand grip strength may have been due to the pain.

It is essential that those working in this sector, as well as doctors who encounter persons who have been exposed to self-injection, are familiar with the recommendations pertaining to such accidents. In this way, we can ensure that those who are injured are rapidly treated, and that the treatment is properly carried out.

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*The patient has consented to the publication of this case report and the accompanying images.*

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## LITERATURE

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