Infiltration therapy for back pain

Example: golf

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Back pain can have varying and sometimes multiple causes. The treatment options include physiotherapy and physical measures and, in severe cases, surgery. Analgesics should not be used long-term and only under medical supervision. One other effective treatment method is the use of injections to alleviate pain/reduce inflammation.

An overview article in 2012 [1] comes to the conclusion that approx. 35.5% of the global population will experience deep back pain at some point in their lifetime. Those who subsequently develop chronic back pain are particularly badly affected. Frohn [2] reports that chronic back pain occurs in 81% of German competitive athletes. 31% of Italian Series A football players regularly use analgesics. In golf, a representative survey of German golf players [3] showed that after play 16% of golf players suffer from symptoms in the lumbar spine, 6.5% in the thoracic spine and 14.1% report pain in the cervical spine. High mechanical forces act on the different segments of the spine during the golf swing. Compression forces of 4300 N have been detected in segment L4-5 [4]. If this is compared with the maximum threshold for men in segment L5-S1 of 3200 N set by the Occupational Health Insurance Association and published as far back as 2/2003 in its report on occupational diseases, it is clear just how great the load on the back is during each golf swing. Specific symptoms also arise in golf players with certain swing patterns with high biomechanical loading, such as slices, where right-handed players skew the ball to the right of the ball-target line. A study on 314 golf players showed that 17.3% struck the golf ball in this way. Back pain persists for more than 2 weeks in 10% of slicers [5].

Causes and treatment options

The chronic pain experienced by golf players can often be attributed to irritation of the nerve roots. Spinal stenosis and facet joint changes play an additional role. Pain is mostly associated with the local release of inflammatory mediators. Anti-inflammatory medication is therefore often effective. The doctor will seek to identify the precise location of the pain focus. If this is successful, a local anaesthetic can be injected in the short term. The success may also be more long-term, as shown by a study conducted by our working group of 324 treatments for specific lumbar symptoms [6]. Local glucocorticoid injections also reduce inflammation for up to a few weeks. Glucocorticoid intervention has an inhibitory effect on the regeneration of the affected tissue. Other undesirable effects may range from water retention to cortisone-induced psychosis. A possible effect on GABA and monoamine neurotransmitter systems is also being discussed [7]. In our experience, Orthokine therapy has proved to be an effective and well tolerated option to promote regeneration. The therapy first involves the taking of a small amount of blood with a special medical device (EOTII). No foreign substances are added. The blood is then stored at body temperature and clots, the blood cells releasing anti-inflammatory mediators including cytokines and growth factors. The autologous conditioned serum (ACS) is then separated by centrifuge and is available for reinjection into the affected tissue. It is injected either at the nerve root or into the facet joint guided by imaging [8 – 10]. This procedure is normally repeated two or three times to achieve a long-term effect – in sports medicine as well [11]. The mechanism of action is thought to be the inhibition of pyrogenic interleukin-1, as ACS contains elevated levels of IL-1 receptor antagonist. This inhibits the binding of IL-1 to IL-1 receptors, including those on glial cells. Studies have identified other possible mechanisms that may explain the long-term effect of ACS: ACS induces the proliferation of stem cells in vivo (muscle satellite cells; [12]) and in vitro (adipose-derived mesenchymal stem cells, AdMSC; [13]). ACS-treated AdMSC demonstrate, in vitro, enhanced division, differentiation and immunomodulation compared to the control. A further mechanism is the restoration of the activation of microglia (macrophages). In the pro-inflammatory state (M1 type), these cells produce IL-1, TNFa and NO* as well as other substances and are able to perpetuate inflammation. When switched to M2 type, they produce anti-inflammatory IL-1Ra, IL-4 and IL-10. This suppresses autostimulation and explains the long-term effect. In the knee joint it has been shown that ACS injection results in reduced levels of IL-1, NO* and oxygen radicals (ROS) in the joint and in enhanced endogenous IL-Ra production. This is associated with improved pain and function and viscosity of the synovial fluid. Studies on various groups demonstrate the effectiveness of this method in treating back symptoms (8 – 10; 14].

Case study: 72-year-old competitive golf player (Bavarian Senior Golf League)

In the late 1960s, the athlete competed in athletics at a high level and was among the top sprinters In Bavaria with a 100 m time of 10.7 seconds on a cinder track. He also played football, also as a semi-professional, and senior tennis until the start of 2000. Fig. 1 shows multisegment functional and structural neuroforaminal stenosis of the lumbar spine secondary to disc degeneration and protrusion and bilateral facet and sacroiliac joint arthritis. There is also spondylosis at the vertebral arches of L5 with grade 1 spondylolisthesis at L5/S1. The spondylosis is most marked at L3/4 with osteochondrosis and marked disc damage. With a pain VAS score of up to 9 after golf play or training, the athlete required intensive treatment with oral analgesics, including opioids. To localise the symptoms, local anaesthetic was infiltrated under image converter monitoring into lumbar segments L4/5 and L5/S1 as well as into both sacroiliac joints (Fig. 2).

Infiltration therapy was performed with ropivacaine (7.5 mg/mL) and with 1 mL Orthokine ACS per infiltration at/into the facet joints and perineurally and 2 mL per infiltration into the sacroiliac joint, with infiltration per session of 12 mL ACS in total. This therapy resulted in the return to competitive golf and in the further course in a marked pain reduction with a maximum pain VAS score of 4. Further therapy following the same therapy pattern was subsequently administered after 3 and 5 months. In the further course opioids were no longer required. Local physiotherapy including TENS therapy is sufficient to maintain fitness to play competitive golf. Local use of endogenous blood components in competitive sport has been accepted as the treatment of choice in sports medicine by WADA and NADA since 2010. The first author became involved with others in establishing the therapy as from 2005. The procedure can be repeated multiple times without any concerns about undesirable effects, as important, purely endogenous regenerative substances are involved. In the right hands and with proper use, this therapy using endogenous blood components is an important element of modern sports medicine, and for recreational sport too.

For the list of references, go to info@thesportgroup.de

Fig. 1 X-ray of lumbar spine in 2 planes and MRI axial slices focusing on foraminal stenosis at L4/5 and L5/S1 (the two small images)

Fig. 2 image converter-guided infiltration on the lumbar spine