CORRESPONDENCE

The Epidemiology, Etiology, Diagnosis, and Treatment of Osteoarthritis of the Knee

by PD Dr. med. Joern W.-P. Michael, Dr. med. Klaus U. Schlüter-Brust, Prof. Dr. med. Peer Eysel in volume 9/2010

Almost Ineffective

The authors recommend paracetamol as first-line treatment as well as long-term treatment for symptomatic osteoarthritis of the knee, in accordance with the analgesic/therapeutic guideline set out by EULAR. In 30 years of clinical practice, I have found paracetamol almost completely ineffective for arthritis pain. Non-steroidal anti-inflammatory drugs (NSAIDs) were notably more effective, if necessary in combination with proton pump inhibitors and for short-term combination treatment with metamizole. At low dosages, NSAIDs have a low side effect profile, even during long-term treatment. With paracetamol, there is a risk of liver damage if maximum doses are taken regularly. This is one of the reasons why paracetamol is now available on prescription only. In own my clinical practice, intra-articular injection of a steroid has always proved the best treatment for acute severe pain.

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Effects of Acupuncture

Since 2006, acupuncture for osteoarthritis of the knee has been included in the list of healthcare services that are covered by the statutory health insurers. More than 10 000 doctors have become qualified according to the quality assurance agreement for acupuncture in patients with chronic pain, according to §135 section 2 Social Code Book V (SGB V), and regularly practice acupuncture. *Deutsches Ärzteblatt* (1) reported initial results from the nationwide model projects (Charité Berlin und TU München) in 2006. According to the findings, acupuncture is at least as effective as standard treatment.

In 2007, the authors of the GERAC study based at Bochum's Ruhr University summarized the efficacy of acupuncture in *Deutsches Ärzteblatt* (2): "10 to 15 acupuncture sessions, verum as well as sham, alleviated symptoms more effectively than conventional therapy."

Surely this means that conservative and guideline-conform treatment for osteoarthritis of the knee should be replaced with acupuncture?

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The author was the chair of the German association for medical acupuncture (DAEGfA, a charity) until 13 May 2010.

Endoprosthesis Required

The article is subject to several important omissions, in particular endoprosthetic knee replacement, the standard treatment for severe osteoarthritis of the knee, which is performed more than 100 000 times in Germany every year. The case patient presented in the article was clearly in need of an endoprosthesis.

I would therefore ask the authors for a comment on the need for endoprosthetic knee replacement, because their scientifically well presented article is incomplete as it stands and may mislead less experienced doctors if this important therapeutic option is not offered to patients.

Treating extensive osteoarthritis by means of a new surface from a monocondylar or bicondylar sliding prosthesis is the only method by which the pathology is actually removed; it should therefore have been mentioned in a prominent position in the article. The described surgical measures do not include this important therapeutic option.

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Tried and Tested Recommendations

The benefits of the microfracturing technique in the medium to long term are questionable. This applies particularly to cartilage lesions larger than 4 cm^2 (1). Osteochondral transfer methods—for example, mosaicplasty—yield good results even in the longer term. If lesions exceed 4 cm^2 in size, however, the complication and failure rates associated with this approach increase substantially (2). This finding generally does not apply to autologous chondrocyte transplantation (ACT) (2).

A study with an evidence level of 1, which compared conventional ACT (using quality assured chondrocytes) versus microfracturing, yielded significantly better histological results after ACT. Clinically, too, some of the 3 year results for ACT were significantly superior to those achieved by microfracturing. Another randomized study investigating a carrier-based ACT versus microfracturing reported significantly better results for ACT for all clinical scores after only 2 years. A recently published study with up to 20 years' follow-up also points at stable long-term results from ACT and a high degree of patient satisfaction (3). However, similarly reliable long-term results after microfracturing, especially for larger cartilage lesions, have not been reported so far, and neither have mainly good results of this method subsequent to failed ACT or mosaicplasty. In sum, the evidence base for ACT—especially in contrast to microfracturing—has improved steadily in the recent past. Our working group's recommendations for indications and methods for the different biological reconstructive approaches (microfracturing, mosaicoplasty, and ACT) for cartilage lesions of the knee have thus become tried and tested, or even been confirmed, and should therefore continue to be considered in everyday clinical practice (2).

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Low-Dose Radiotherapy

As practicing radiooncologists, we missed a mention of low-dose radiotherapy in the context of conservative treatment in the article, since it has traditionally been much used in Germany and is recognized among orthopedic specialists. The so called x-ray stimulation radiotherapy is used everyday in many patients, including patients with osteoarthritis of the knee, and we would have appreciated at least a brief mention of this method.

Even though randomized controlled studies for this special indication are thus far lacking, many publications of retrospective analyses, including patterns of care studies (PCS), are available.In 2004, investigators noted in the context of such a PCS that every year, 23 752 patients in Germany with degenerative joint disorders , including osteoarthritis of the knee, received x-ray stimulation radiotherapy (1).. In 2004, an orthopedic specialist published the results of a retrospective study with a success rate (pain reduction, absence of pain) of 63% after radiotherapy for osteoarthritis of the knee. A PCS published in 2010 showed that in Germany in 2007, 4544 patients with osteoarthritis of the knee received radiotherapy. Referrals for radiotherapy were made by orthopedic specialists (95.2%), general practitioners (84.6%), surgeons (28.8%), and other specialists (27.9%) (multiple mentions permitted). 25% of patients were free from pain, and a moderate to notable reduction in pain was achieved in 55% of patients who had received radiotherapy (3).

From a radiotherapeutic perspective, low-dose radiotherapy for painful Kellgren stage 2–3 osteoarthritis of the knee at is an effective therapeutic option and can be recommended or undertaken even if surgical interventions are not possible or desirable.

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Current State of Research

Regarding arthroscopy, the authors mentioned a study reported by Moseley et al. The key message of the article, that genuine arthroscopy is not superior to sham arthroscopy, was not clearly depicted, however. Further, a later study reported by Kirkley et al (1), which compared the efficacy of optimized conservative treatment with a combination of conservative treatment plus arthroscopy, received no mention at all. In this study, after 6 and 24 months, no difference was found between the groups. In sum, both studies show that arthroscopy has no greater effect than placebo and is thus not superior to conservative procedures. On the basis of the existing evidence, a more critical evaluation seems reasonable, not least for reasons of cost and safety considerations.

The authors list acupuncture as a physiotherapeutic measure. However, this ignores the very specific effect for acupuncture that was shown especially for the treatment of osteoarthritis of the knee in the well publicized ART study (2). This leads us to conclude that the effect is not merely segmental or physical.

The authors mentioned leech therapy in the same context as herbal and homeopathic remedies, ointments, and special diets, and they categorize its efficacy as questionable. However, 4 controlled studies of leech therapy exist (3 randomized, 1 blinded) (3). The data have consistently shown a significant effect of high clinical relevance in favor of leeches. The conclusion that leech therapy constitutes an unequivocally efficacious option for osteoarthritis of the knee is therefore well founded.

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In Reply:

We wish to thank our correspondents for their numerous and constructive responses, which further underline the importance of not only the diagnosis but also the multifaceted therapy of osteoarthritis of the knee. Among our other intentions, we also wanted to shed a critical light on the pathology that is osteoarthritis of the knee. Unquestionably, however, the details of the different treatments for osteoarthritis of the knee are too numerous and far reaching, and vastly exceed the scope of such an article. We aimed to provide a rough overview and to address learning objectives, such as recognizing risk factors for the development of osteoarthritis of the knee, diagnostic options, preventive measures, and joint sparing treatment.

Professor Lindner laments the omission of knee replacement surgery, the standard treatment for severe osteoarthritis of the knee. We remind readers of the learning objectives. *Figure 2* in our article provides a clear treatment algorithm for patients with clinically relevant osteoarthritis of the knee. In our opinion it is obvious that in pronounced medial stage IV osteoarthritis of the knee, such as is shown in *Figure 1*, an endoprosthetic knee replacement is the treatment of choice.

Dr Rüdinger reminds us that acupuncture for osteoarthritis of the knee is covered by the statutory health insurance companies nationwide. He mentions the GERAC study (published by Ruhr University in Bochum), which summarizes the effects of acupuncture: “10 to 15 acupuncture sessions, verum as well as sham, alleviated symptoms more effectively than conventional therapy.” We need to point out in this context that the inclusion criteria considered Kellgren stage 2 or 3 osteoarthritis. We also emphasized that the notable overall effects in favor of acupuncture on the one hand and the lacking superiority (except for a lacking indication) compared with sham acupuncture give rise to a wide range of interpretations. Ultimately, this needs to be discussed with the patient.

The later study by Kirkley et al (1) comparing the efficacy of optimized conservative therapy with a combination of conservative therapy plus arthroscopy, as pointed out by Professor Michalsen, found no difference. Arthroscopy is therefore not superior to conservative treatment approaches.

One correspondent mentions leech therapy (2). Our article did not aim to provide details of individual conservative therapeutic options. According to the EULAR recommendations (3), paracetamol is the first-line medication of choice. Dr Weiss rightly points out that paracetamol is not necessarily effective in alleviating arthritis pain. However, the non-steroidal anti-inflammatory drugs (NSAIDs) are also included in the EULAR analgesic/therapeutic ladder. Low-dose radiotherapy for painful Kellgren stage 2–3 osteoarthritis of the knee is certainly indicated, as mentioned by Dr Mücke. We agree with the working group for tissue regeneration and tissue replacement within the German Society of Trauma Surgery (DGU) and the German Society for Orthopaedics and Orthopaedics surgery, that the 2004 recommendations for indications and methods for the different biological reconstructive techniques (microfracturing, mosaicplasty, autologous chondrocyte transplantation [ACT]) are tried and tested and should continue to be used in everyday clinical practice.

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