



Hypnosis as an Approach to Control Pain and Anxiety in Anterior Cruciate Ligament Reconstruction and Meniscal Surgeries: Two Case Presentations

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Abstract

Anterior cruciate ligament (ACL) reconstruction is an extremely common surgery in sports medicine and orthopedic surgery. This surgery requires creating tunnels in bones (femur and tibia), which is often associated with severe pain and thus general or neuraxial anesthesia should be applied to mitigate pain and anxiety. This paper follows our previous case report of hypnoanesthesia in hand surgery, discussing the application of hypnosis as a non-pharmacologic intervention for controlling intraoperative and postoperative pain and anxiety, which can contribute to postoperative recovery of patients with ACL surgery. According to the results of this study, it seems better to teach hypnosis as a pain control protocol to anesthesia residents and pain service staff. Also, hypnosis can be considered an anxiety reduction strategy in perioperative phases and also useful for postoperative pain management.

Keywords: Hypnosis, Anxiety, Meniscal Surgeries, Ligament Reconstruction

1. Introduction

Anterior cruciate ligament (ACL) reconstruction is likely the most common surgery in sports medicine and orthopedic surgery. This surgery involves creating tunnels in bones (femur and tibia), which can be extremely painful and therefore, general or neuraxial anesthesia may be required to mitigate the pain and anxiety of the patient. Not only is the surgery painful by itself but also excruciating pain and swelling can be generated around the knee as a result of ACL reconstruction (1). Moreover, emotional disaster can lead to dysfunction or disfigurement of the knee, which may permanently affect the life of the patient and society in general (2).

ACL deficiency can hugely affect the patient's quality of life (1). In fact, such injury may cause psychological and social problems that can interfere with personal and social life of patients. A critical dimension of psychological factors is recovery from surgical procedures, which is often associated with pain and anxiety. Anxiety has been shown to play a crucial role in recovery as it raises the level of perceived pain in patients (3). Overall, some approaches to postoperative pain control are required because postoperative pain can delay patient rehabilitation, prolong hospitalization, increase medical costs, and diminish the quality

of life (4).

The efficacy of psychological techniques such as patient education, cognitive and behavioral interventions, relaxation techniques, hypnosis, therapeutic suggestion interventions, and emotion-based interventions in adults has been assessed based on the outcomes of postoperative pain, perioperative anxiety, quality of life and recovery. Hypnosis is acknowledged as a non-pharmacological pain treatment, which uses relaxation and analgesic suggestions (5). As described earlier, the effective role of hypnotic interventions in medicine (6) as well as dentistry, postoperative recovery (7), and pain control (5) has been well documented.

James Esdaile, the most eminent hypnoanesthetist, reported over 300 major surgical cases using mesmerism as the only form of anesthesia in the first half of the 19th century (8). Hypnosis is currently employed for surgical anesthesia in certain cases, particularly in patients who are allergic to chemical anesthesia or prefer this approach. Recently, hypnosis has been used as an alternative to chemical anesthesia in surgery patients (9), and a highly successful rate has been reported (10). This paper follows our previous case report on hypnoanesthesia in hand surgery (6), discussing the application of hypnosis

as a non-pharmacologic intervention for controlling intra-operative and postoperative pain and anxiety, which can contribute to postoperative recovery in patients with ACL surgery.

2. Case Presentation

2.1. Case 1

The patient was a 37-year-old man who suffered from a left knee trauma 9 months before the surgery and endured pain and instability despite non-operative treatment for more than 6 months. Physical examination showed that anterior drawer, Lachman and Pivot shift tests were positive and there was gross ACL deficiency. Also, Varus and Valgus tests and McMurray's test were negative. He had no history of smoking and drug usage. He did not suffer from any systematic diseases. ACL tearing was observed on MRI.

We made three arthroscopic portals in front of the knee and performed an investigative arthroscopy observing that the ACL was completely detached from its femoral origin. We then preserved the tibial stump and created two tunnels in the footprints of the previous ligament. Achill allograft was provided by the local bone bank and a two-strap new ligament was created and passed from the tunnels to be fixated in femoral and tibial sides by endobutton and bioabsorbable screws. Finally, we examined the joint, which was completely stable with a full range of motion without any impairment. The early range of motion and walking were reinforced after surgery. The patient felt healthy and happy without using any pain killer in the ward and could leave the hospital the day after the surgery.

2.2. Case 2

The patient was a 27-year-old woman who had right knee pain, snapping and intermittent locking for more than 11 months before admission. The physical examination indicated that the knee was stable. Medial joint line tenderness and a small amount of effusion were observed. The range of motion was preserved, but it was associated with some pain at the end of flexion. The McMurray test was negative. She had no history of smoking and drug usage. She did not suffer from any systematic diseases. Medial meniscus tearing was obvious in MRI. We performed an arthroscopy by creating two portals in front of the knee. The cruciate ligaments were intact and the posterior horn of medial meniscus had a complex, non-repairable tearing. Thus a partial meniscectomy was performed for the patient. She did not take any pain killer (and we did not hesitate to provide her some upon her request) after the surgery and could leave the hospital the day after the surgery.

It should be noted that we used bispectral index monitoring as standard monitoring for evaluating wakefulness

or the depth of anesthesia. It showed 91 - 98 included full awareness. We recorded all procedures, including BIS score, heart rate, and blood pressure range on video. Patients were talking with the surgery team during procedures while the surgery was going on and they were in calmness and full awake. Also, we asked patients on the video to move the opposite side to show we have not used spinal or epidural anesthesia. We recorded verbal patient informed consent on video and they explain clearly they know what is hypnosis and the whole procedure was explained to them before they acclaim their acceptance.

2.3. Intervention Method

Both cases were scheduled for hypnoanesthesia due to their persistent request for relieving severe anxiety. In the operation room, standard monitoring tools, including electrocardiogram, non-invasive blood pressure monitoring and pulse oximetry, were provided. Also, the patient's awareness was measured by bispectral index (BIS) monitoring. After prep and draping of the injured knee, the hypnotic induction was performed by a hypnotherapist who was also an anesthesiologist, (the first author) using eye fixation and verbal suggestion technique. The deepening of hypnotic trance was triggered using various techniques.

In the first case, the image of walking in a valley between the mountains of his village was used. This image was chosen based on of his interests expressed in the pretalk stage (before induction of hypnotic trance). Then the imagination was continued by fantasizing a lake and focusing on pleasant coolness of water and small red fishes nibbling at his knee, as well as birds flying around the lake. This imagination was selected to conceal the touching of the knee by the surgeon and incision on the skin. Imaginations were influenced by the manner of surgical procedure and ideomotor signals of deep trance in the patient were monitored. The imaginations continued until the end of surgery. At the final stage of surgery, the patient was a candidate for postoperative analgesia.

In the second case, imaginations were informed by the patient's interest in her 4-year-old son. She was guided to imagine singing her favorite song next to her son, which was intended to dissociate her sensation in the operation room. During the surgery, she was engulfed in the imagination of taking care of her child, talking to him, and so on. At the end of the surgery, she was conditioned for pain control after surgery. Tourniquet was inflated up to 350 mmHg for 60 minutes. During the surgery, no significant increase in the heart rate and blood pressure was observed compared to the baseline. BIS score varied from 92 to 98 in the first case and 85 to 100 in the second case throughout the surgery. Also, the heart rate of both cases was 78 - 85 m, and their blood pressure was in the normal range (110/70 - 125/85).

Both of the patients were in the hypnoidal state and kept talking to the hypnotist and surgeon during the surgery. In the last phase of hypnosis, the patients were conditioned for the postoperative analgesia. They were discharged from the hospital with full awareness 12 hours after the surgery. The follow-up was done 6 days after the surgery with the results, indicating the lack of pain without taking any analgesic drugs.

3. Discussion

In this case presentation, we introduced two cases of arthroscopic ACL reconstruction and meniscal surgeries using hypnosis instead of general or neuraxial anesthesia. We reported the use of hypnosis to induce calmness and control pain during and after the surgical procedure (11). Further, the efficacy of hypnosis in pain control during surgery as an alternative to general or neuraxial anesthesia was shown (6). Renner et al. used hypnoanalgesia to control pain in patients with abortion, reporting that analgesic drugs could significantly diminish patient pain (12). Dufresne et al. also applied hypnoanalgesia to 290 women with abortion successfully (13). Also, the successful application of hypnosis as an alternative to general anesthesia in open hand surgery has been reported (6).

Hypnosis is an attentive and receptive brain state. This state can be induced by mental absorption to the main concentrated subject and dissociation from other subjects. Verbal suggestions and creating of goal-directed imaginations are principle elements of hypnosis. In this state, the variety of brain waves may be seen, according to imaginations. Then guided imaginations lead attention to elicit therapeutic results. There are many alterations in the brain mechanism, which happen by hypnosis such as neurotransmitters alterations. Hypnotic imaginations may induce positive emotions, which reduce pain sensation.

In this case presentations, there was no response to inflated tourniquet, indicating that hypnosis could be a reliable alternative to nerve block or general anesthesia. Lack of postoperative pain was another advantage of hypnosis observed in our study. Both surgeons and patients were satisfied with the results of the hypnosis.

3.1. Conclusions

We reported the use of hypnosis instead of general anesthesia or neuraxial blockade for ACL reconstruction and meniscal surgeries. This is the first study to report these results. Our experience showed that hypnosis could be used in major surgeries without using analgesic or anesthetic drugs. Hypnosis may substitute drugs and therefore, avoid side effects of medications. Consequently, it is natural to expect higher satisfaction of the patient and accelerated discharge from the hospital, which in turn can

reduce treatment costs. We suggest teaching hypnosis in pain control protocols to anesthesia residents and pain service staff. Furthermore, hypnosis can be considered an anxiety-reducing and pain-controlling strategy in peri- and post-operative phases.

Footnotes

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Patient Consent: The patient's informed consent was verbally recorded on the video.

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