Effects of the lower extremity external fixators on the sexual life of males

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Objective: In tibial fractures, the use of an external fixator (EF) may be associated with sexual dysfunction (SD) in sexually active male patients. We aimed to investigate the influence of EF applied for tibial fracture on the sexual life in male patients.

Methods: We retrospectively evaluated 137 male patients who presented with tibial fractures and underwent surgical intervention with unilateral or circular EF. The patients completed the Brief Sexual Function Inventory (BSFI) form during the interview. We evaluated the incidence of the development of SD and the severity of SD with the use of an EF, and the relation with the type of EF and SD was investigated. The responses were compared with the results of the completed BSFI forms of 119 male patients who were treated with internal fixation (IF) for tibial fractures.

Results: In total, 108 patients (mean age, 42.8 years) treated with EF accepted the invitation and filled the form. The score of those patients were worse compared with that of the patients who were treated with IF (P < 0.001). Postoperative sexual functions were the same with the preoperative sexual function in 12 patients (11%). However, the postoperative scores were decreased in 96 (89%) patients, which meant that the sexual functioning was impaired. None of the patients reported persistent SD.

Conclusion: EF in the cruris may impair sexual functions in males. The rate of SD was higher in male patients who were treated with EF. Thus, SD might be associated with physical, psychological, and social limitations caused by EF.

Keywords: Cruris; dysfunction; external fixator; fracture; sexual; tibia.

Level of Evidence: Level III, Therapeutic study.

Sexual dysfunction (SD) has a strong negative effect on the adult’s quality of life.\textsuperscript{[1,2]} In the general population, it effects 10\%–52\% of men and 25\%–63\% of women.\textsuperscript{[3,4]} Any sexual problem may result in a deep negative impact on an individual’s life.\textsuperscript{[5]} Therefore, sexual functions should also be evaluated.

Although it is reported that sexual health is important in a patient, physicians rarely question SD.\textsuperscript{[6,7]} In fractures that require surgery, the focus is mostly on the treatment of the fracture. Appropriate attention is paid for performing the procedure properly, complete healing of the fracture, and avoiding any complications. However, the psychosocial consequences of the procedure and implant are generally overlooked. There is limited data on these psychosocial consequences in the literature. Nevertheless, sexual problems experienced by sexually
active individuals due to an external fixator (EF) is an important area which has not been studied extensively and have a significant impact on the psychological well-being of the patient.

Although there are many previous studies that have focused on EF, there is no information about the effects on the sexual life of individuals. There is a need for further research on this topic.

The objective of the present study was to examine the effects of EF on the sexual life of male patients whose tibial fractures were treated with EF.

Patients and methods

This was a single-center tertiary care hospital-based study, which was approved by the institutional review board. A total of 137 male patients who presented with tibial fracture and underwent surgery between January 2008 and March 2013 were invited to participate in this study. The inclusion criteria included male patients who were treated with EF for a tibial fracture without any additional organ and other bone injury. The subjects were aged 20–60 years, sexually active and married, reported to be having a regular sexual life, and no previous systemic disease that could affect sexual functions at the time of injury. The first two postoperative weeks were excluded during the analysis of problems experienced by the patients. Patients with any current psychiatric condition that may affect sexual functions were excluded. The patients were evaluated at least 1 year after the primer surgery (mean 3.2 years; range 1–5 years) and informed about the study. Eleven (8%) diabetic patients were excluded. Eight patients (5%) did not show up for the interview. Ten patients (7%) rejected to participate. A total of 108 patients (mean age 42.8 years; range 26–57 years) who provided their consent to participate were interviewed. The patients were interviewed about their sexual life, and their sexual functions were rated based on a self-report measure. All interviews were conducted by the same interviewer to avoid any observer bias. Any patient who responded as “I'd significant sexual problem while I was having an EF device” to the first question on sexual functioning was considered to have SD. The patients were asked to rate their sexual life before the trauma, while having an EF, and after the removal of the EF by selecting from five possible responses (bad, not so good, good, quite good, or very good). They were asked if the EF led to a change in their present sexual life, and if it did, then they were asked if they sought any help from a mental health practitioner or an urologist. They were also asked about sexual problems they experienced while having the EF, and their causes and their frequency of sexual intercourse per month. The patients were asked to complete the Brief Sexual Function Inventory (BSFI), which provides a more objective and consistent evaluation of the sexual function in men. BSFI is composed of 5 main domains and 11 questions to measure SD and its severity in men (Figure 1).

The patients were asked to subjectively evaluate the severity of SD by rating each question on a 5-point semantic differential measure (0–4). The total score ranges from 0 to 44, and the lower the score is the more severe is the degree of SD. We calculated the BSFI scores for each patient.

The BSFI results were compared with the results of a control group. The control group consisted of 117 male patients (mean age 41.1 years) who underwent surgery with internal fixation (IF) for tibial fractures at the same period using the same criteria as those who were treated with EF, and they agreed to participate in the study. The Statistical Package for the Social Sciences (SPSS) version 17.0 (Chicago, IL, ABD) was used for statistical assessments. A p value of <0.001 was considered statistically significant, and the results were expressed as mean ± standard deviation.

Results

Thirty-two patients (29%) were younger than 40 years of age. The causes of injury were traffic accidents (33%), falls (26%), shooting incidents (18%), motorcycle accidents (16%), and occupational accidents (7%). While 82 patients (76%) only had a tibial fracture, 26 patients (24%) also had accompanying malleolus or fibular shaft fracture. Of these fractures, 37 (34%) were closed and 71 (66%) were open. In addition, 59 fractures (55%) were treated with circular EF, and 49 (45%) fractures were treated with unilateral EF.

A 100 patients (93%) who responded as “I'd significant sexual problem while I was having an EF device” to the question on sexual functioning was considered to have SD. Of the 8 patients (7%) who did not report a serious problem in the sexual functions, 2 had circular and 6 unilateral EF. There was no relationship between trauma severity and developing SD in patients who are treated with EF.

The response to the question “How was your sexual life when you had EF?” was “bad” and “not so good” in 100 patients (93%), while 8 patients (7%) responded “good.” Those who responded “good” indicated that there was no serious impact on their sexual life, although they experienced some problems during sexual intercourse. Based on the questionnaire results, there was a reduction...
of 50% in sexual drive, 50% in getting an erection, 40% in achieving ejaculation, and 39% in overall sexual satisfaction. According to the subjective evaluation of patients, the reduction was associated with physical (77%) and psychological (23%) consequences of the trauma. When compared with circular EF, those with unilateral EF experienced fewer problems.

All of the patients who had sexual problems indicated that they experienced one or more problems during sexual intercourse. Of 108 patients, 32 (30%) had 1 complaint, 72 (66%) had 2 complaints, and 4 (4%) had 3 complaints. The main complaints were difficulty in positioning and EF causing tears in sheets.

The patients who agreed to participate in the study replied to all the questions in the questionnaire. The mean score for each question is shown in Table 1.

SD was present when the patients had an EF device. None of the patients experienced persistent SD after the removal of the device.

In patients with EF, the BSFI scores ranged from 27 to 42 (mean: 36.2) before the surgery compared with 28–39 (mean: 35.1) after removal of the EF device and 4–40 (mean: 21.3) while having the device. On the other hand, the mean BSFI score in patients with IF was 35.6 (range: 30–44) during the preoperative period and 34.8 (range: 29–42) during the postoperative period. Although there was no significant difference in the mean BSFI scores between the preoperative period and after the removal of EF (p<0.001), the scores were significantly decreased while having EF compared with the preoperative period (p<0.001). The mean score for each individual item in the BSFI was lower in the EF
The reduction in the frequency of sexual intercourse per month was also noteworthy. Although the mean frequency of sexual intercourse per month before the surgery and after the removal of the EF device was 12.2 and 12.1, respectively, it was 1.56 while having an EF device. The causes of reduction are shown in Table 3. The frequency of sexual intercourse in patients who were treated with IF was 12.4 before the surgery, whereas it was 11.3 after the surgery.

None of the patients reported the need for support from any psychiatrist, psychologist, or urologist for SD.

**Discussion**

Human sexuality is a manifestation of care and love as well as physical unity.[9] Therefore, negative changes in sexual life should be well-recognized and investigated.[10,11] Sexual life may vary to a great extent between individuals; therefore, self-assessment of it may be too subjective.[12]

Although the negative effect of trauma and various diseases on sexual functioning has been generally reported, the magnitude of the impact is based on different reasons. Physical, neurological, and psychological factors and overall health have been implicated in SD.

Recently, several studies have been conducted regarding the presence of any post-traumatic effects on sexual functioning in male and female patients as well as their causes and consequences. Mathew published a report on these effects on men and women, while Metze and Ozumba conducted a study with only men following pelvic injuries.[2,8,11] However, there is no study on the changes in sexual functions in patients who are treated with EF. The present study is the first study designed to explore the effects of EF on the sexual life and their causes in male patients whose lower limbs were treated with EF.
The study only included male patients with a regular sexual life. The study was based on the retrospective evaluation of sexual functions in male patients with tibial fractures before the injury, during the use of EF, and after the removal of EF. The information on sexual functioning throughout these three periods was obtained retrospectively. We also investigated the presence of other sexual disorders or systemic diseases that might have interfered with sexual functions. The absence of such diseases was potentially considered to have made our results more objective.

The face-to-face interviews were conducted in the hospital setting. Thus, more intimate responses were obtained from the patients. The first two postoperative weeks were excluded during the analysis of problems experienced by the patients because we believed that hospitalization and other factors associated with the trauma might have interfered with our observations. The rate of participation in our study was 86%, while the rate of response to the questionnaire was 100%. Although our patient population was small, we thought that higher participation and response rates increased the reliability of our results.

The prevalence of SD was reported to be 15%–22% in a multi-national population-based study by Nicolosi. In the present study, we used the BSFI questionnaire for assessment, which provides a more objective and consistent evaluation of the sexual function in men. The BSFI questionnaire showed that there was a significant reduction in sexual functions during the use of an EF device. Ninety-five percent of patients experienced SD in varying degrees. The higher prevalence and severity of SD were noteworthy in the present study. Although there was a reduction of 50%, particularly in sexual drive and getting an erection, the reduction was 40% in achieving ejaculation and 39% in overall satisfaction with respect to sexual life. In the literature, it has been reported that 43.6% of patients admitted to the intensive care unit following a general trauma developed SD.

The present study has six key findings:

1. Almost all male patients developed SD in varying degrees during the use of EF.
2. There was no relation between the trauma severity, fracture type, and SD because SD occurred in minimal trauma and simple fracture when EF was used.
3. There was no relation between the age of patient and SD associated with EF, but there was relation between the shape of EF and severity of SD.
4. Development of SD while having an EF device is a temporary event. It was not present before the trauma, and it resolved in all patients after the removal of EF.
5. All of our patients reported that they did not feel any need to discuss and seek for help regarding these problems.
6. Physical and psychological factors were involved in the development of SD.

Our study had some limitations. Firstly, we had a small patient population and did not include randomization. They may not be representative of all male with EF patients, and the inclusion of more patients may alter our findings. We believe that there is a need for more comprehensive studies with larger number of patients. Because it was a retrospective study, the assessments were based on the subjective self-reports of our patients.

EF is a device which is difficult to carry, exerts an extra burden on the individual, potentially restricts mobility, leads to change of clothes during use, and causes damage in surrounding goods such as sheets. We thought that such characteristics might have been associated with a higher rate of physical effects. As described by the patients, the appearance and volume of the EF device might lead to psychological effects because they believed that it might harm their sexual partner, and they have a fear of loss of erection resulting from any pain in case of an abnormal movement.

One of the indications that show the presence of a negative impact on sexual function was the reduction in the frequency of sexual intercourse per month. The most common cause of this reduction was reported as the need for bathing-ritual ablution of the whole body after sexual intercourse in the Muslim culture. It was observed that they were afraid of any contact of the EF device with water during bathing, which may lead to development of an infection.

We think that having an EF may lead to stress in the patient and among family members. When the effect of sexual function on the quality of life is considered, we believe that this problem should be profoundly managed. The experience of sexual problems only during the use of the EF device and the complete resolution of such problems after the removal of EF indicates that it is a temporary problem. Therefore, patients should be asked if they experience any sexual problems during control visits, and if they respond positively, they should be asked whether the onset of these problems was during the use of EF. If they indicate that it started following the procedure, it would be appropriate to tell them that it is temporary.

If we do not consider the potential impacts on sexual functions in patients whose tibial fracture are treated...
with EF, they may go unnoticed. If we do not direct any question regarding such problems, they may not talk about their problems. None of our patients had reported their problems until we asked them. When they were asked why they did not mention their sexual problems, 74 patients (68%) reported that they felt ashamed, 15 patients (13%) thought that the problem was temporary, 6 patients (5%) believed that it was not a priority among other problems, and 5 patients (5%) felt that it was unnecessary to discuss about it. The results of the present study showed that we should also examine any sexual and psychological problems while evaluating fractures. Based on our experience, most of the male patients would indicate that the presence of EF on their lower limb has a negative impact on their sexual life when they are asked.

We believe that SD is a clinically significant and unrecognized problem in adult male patients who are treated with EF. Most of the male patients who experience SD do not seek for treatment because of ignorance, misinformation, and feeling of shame. These results should encourage clinicians to question the sexual functions of male patients during follow-up after EF.

Based on the present study, we think that to avoid problems in sexual functions, when it is relatively necessary to use EF, preferring to use IF may be an option, and when use of an EF device is inevitable, the option of removing it as soon as possible and replacing it by appropriate IF material should be considered.

Conflicts of Interest: No conflicts declared.

References