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Orthopedic Patients with Mental Disorder: Literature Review on Preoperative and Postoperative Precautions

Jun-Il Yoo, MD, Yonghan Cha, MD*, Jung-Taek Kim, MD†, Chan Ho Park, MD‡, Wonsik Choy, MD*, Kyung-Hoi Koo, MD§

Department of Orthopedic Surgery, Gyeongsang National University Hospital, Jinju,
**Department of Orthopedic Surgery, Daejeon Eulji Medical Center, Eulji University School of Medicine, Daejeon,*
†Department of Orthopedic Surgery, Ajou Medical Center, Ajou University School of Medicine, Suwon,
‡Department of Orthopaedic Surgery, Yeungnam University Medical Center, Daegu,
§Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

Because of the increasing global trend of patients with mental disorders, orthopedic surgeons are more likely to encounter orthopedic patients with mental disorders in clinical settings. Identifying the characteristics of these patients and implementing psychiatric management can affect the clinical outcome of orthopedic treatment. Thus, orthopedic surgeons need to assess the psychiatric medical history of orthopedic patients with mental disorders before surgery and understand the psychological and behavioral patterns of patients with mental disorders. In addition, appropriate psychiatric consultations and evaluations are necessary to prevent worsening of mental disorders before and after surgery.

Keywords: *Orthopedic surgery, Mental disorder, Depression, Assessment, Complication*

There have been various changes in the diagnostic criteria for mental disorder since introduced in the 1970s, and now several diagnostic assessments are needed to diagnose mental disorders.[1,2] Studies of psychiatric epidemiology conducted in several countries have reported differences in regional and genetic characteristics, as well as the influence of these changing diagnostic criteria.[3] A meta-analysis of 174 surveys in 63 countries reported that the prevalence of mental disorders was steadily increasing.[2] When asked if they had ever experienced a mental illness at least once in their lifetime, 29.2% of subjects of the general population answered yes, and 17.6% reported that it had lasted more than a year. Also, according to sex, drug addiction was more common in men, and disorders related to mood or anxiety were more common in women. This study reported that regional differences in mental disorders were also observed: there were not only fewer studies on the prevalence of mental disorders in East Asia, but also a lower prevalence of mental disorders than in other regions.

However, several studies on the prevalence of mental disorders in South Korea reported a fairly high prevalence and a rapidly increasing trend. Cho et al.[4] found that the prevalence of major depressive disorders in the elderly population ranged from 4.2% to 9.1%, the prevalence of clinically significant depressive symptoms was between 9.1% and 33.0%, alcohol-use disorders constituted up to 13.6%, and sleep disorders accounted for 22% to 58% of the elderly. Based on a survey on the prevalence of bipolar affective disorder, Jung et al.[5] has reported that the prevalence is higher currently than in the past. It is also known that the rate of deaths by suicide in South Korea has been the highest among the members of the Organiza-

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Correspondence to: Yonghan Cha, MD
Department of Orthopedic Surgery, Daejeon Eulji Medical Center, 95 Dunsanseo-ro, Seo-gu, Daejeon 35233, Korea
Tel: +82-42-611-3280, Fax: +82-42-611-3283
E-mail: naababo@hanmail.net

tion for Economic Cooperation and Development (OECD) since 2003.[6] Therefore, orthopedic surgeons are likely to encounter patients with mental disorders in clinical situations, and identifying the characteristics of these patients and implementing psychiatric management can affect the clinical outcome of orthopedic treatment.

Our purpose in this review article was to investigate the factors that orthopedic surgeons should consider before and after surgery for orthopedic patients with mental disorders and to introduce the factors that affect clinical outcomes of surgery.

THE NEED FOR PSYCHIATRIC EVALUATION AND UNDERSTANDING OF BEHAVIORAL CHARACTERISTICS OF PATIENTS WITH MENTAL DISORDERS

In cases of spinal cord stimulator implantation surgery for the control of complex regional pain syndrome, bariatric surgery, and gender transition surgery, psychiatric evaluation was needed before surgery because of the high possibility of accompanying mental illness, but recently the need for mental state examination is expanding to several operations, such as carpal tunnel surgery, temporomandibular disorder, deep brain-stimulator insertion for Parkinson disease, and cosmetic surgery.[7] There are several reasons for which preoperative psychiatric evaluation is necessary. The first is that some operations, such as organ transplantation, amputations, and bariatric procedures, are expensive, and lifestyle changes or patient cooperation after surgery greatly affect clinical outcomes.[8] The preoperative psychosocial evaluation process serves to establish a positive and trusting working relationship between the patient and medical personnel. Furthermore, established trust and rapport could enhance the patient's willingness to change lifestyle or behavioral support.[9] Second, psychiatric disorders increase the length of hospitalization after surgery, surgical complication rate, and in-hospital mortality rate, thereby increasing both the economic and psychological burden of the operator.[10] Stone et al.[11] reported that patients with a psychiatric diagnosis or psychotropic medication had increased healthcare utilization in the postoperative period after total hip and knee arthroplasty. Third, the behavioral patterns of patients with mental disorders in hospitals differ from those of the general population.[12] This may require medical personnel to have different communication approaches and attitudes towards patients than they used to. For example, patients with mental disorders may feel that they are being ignored by the medical staff or that they are being treated differently from other patients. In addition, they often try to seek unproven treatment methods and actively intervene in treatment protocols. Although they sometimes feel grateful to medical staff, the feeling of ignorance may be expressed in violent behavior. Thus, medical staff who will be working with patients before and after surgery should obtain important information through preoperative psychosocial evaluation, such as specific behavioral patterns and activities associated with mental disorders.[9]

THE PURPOSE OF PSYCHIATRIC ASSESSMENT

The purpose of psychiatric assessment is to identify the state of mental illness and provide useful information to patients to help them stay without problems during hospitalization, while creating a better condition for surgery, establishing a plan to control postoperative mental illness, and ensuring good clinical outcomes of surgery.[7] Various methods, such as the Beck Depression Inventory, Quality of Life Inventory, patient-reported outcomes measurement information system Anxiety, Depression, Physical Function, and Pain Interference computer adaptive tests, Hamilton anxiety scale, and Hamilton depression scale, are suggested as assessment tools (Table 1). However, the most important assessment method is a clinical interview with a psychiatrist, and the role of an orthopedic surgeon may not appear to be significant. Nevertheless, orthopedic surgeons must try to additionally discover various risk factors that affect the patient's condition after surgery.

SIX CONSIDERATIONS FOR PREOPERATIVE PSYCHIATRIC EVALUATION

It is reported that psychiatrists must check the following six issues for patients considering surgical treatment before preoperative consultation with surgeons (Fig. 1).[8] The first is to find out whether there is a major mental illness. The most common mental illness is mood disorders, and surgery can trigger mood episodes. Thus, these patients should be educated on the early symptoms of mental illness and behaviors that require treatment. Also, surgeons should present a treatment plan in advance. If symptoms are not well controlled and social support is not sufficient, proceeding to surgical treatment is not recommended. The second is to find out if the patient has an addiction to a substance or an active mental disorder. Surgery is not recommended until the patient is treated for drug addiction or active mental disorder, and a plan to prevent recurrence after surgery should be considered.

Table 1. Evaluation Tools for Psychiatric or Premorbid Psychiatric Conditions According to Type of Mental Disorder

Type of mental disorder	Evaluation tool
Anxiety	BSI anxiety scale
	Hospital anxiety and depression scale
	Patient-reported outcomes measurement information system anxiety
	Hamilton anxiety scale
Depression	Beck depression inventory
	BSI depression scale
	Center for epidemiologic studies depression scale
	Hamilton depression scale
	Brief symptom rating scale
	EQ-5D quality of life
	Quality of life inventory
PTSD	Primary care PTSD screen for DSM-5
	Clinician-administered PTSD scale for DSM-5
	PTSD checklist for DSM-5
	Activity of daily living
	Physical components summary score and mental components summary score as measured by the 12-item short form survey.
	Disabilities of the arm, shoulder and hand score

BSI: brief symptom inventory, EQ-5D: EuroQoL five-dimensional instrument, PTSD: posttraumatic stress syndrome, DSM: diagnostic and statistical manual of mental disorders.

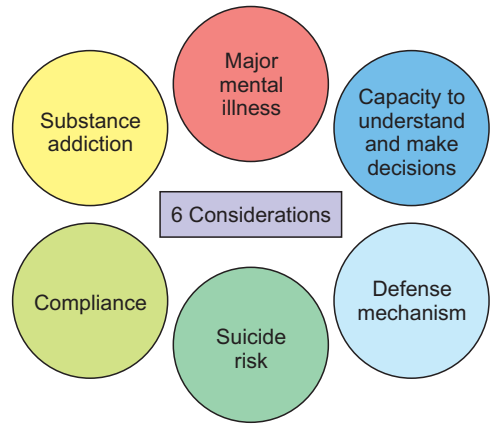

Fig. 1. Diagram for six considerations in preoperative psychiatric evaluation.

The third is to find out if the patient can understand the surgery and treatment process and make decisions. If the patient is incapable of understanding the process of treatment or making decisions, the risks and benefits of the treatment or surgery should be considered. For example, under conditions of uncertainty, individual differences in the weighing and estimation of information or circumstance have the potential to strongly influence patient's behavior.[13] Thus, because of these individual differences, anxiety and depression are associated with difficulties in decision making. Fourth, the patient's treatment should be assessed. Patients may need special medication after surgical treatment, and sometimes they may need lifestyle modifications. Therefore, it can be an important issue whether the patient will be able to adhere to future treatment plans. It is also useful to check whether compliance with treatment was good in the outpatient office or to obtain information about the patient's condition from a guardian or caregiver.

The fifth issue is to check the patient's defense mechanism against stress. If a primitive defense mechanism, such as psychotic denial, delusional projection, distortion, fantasy, projection, and passive aggression, was shown through questions about methods of coping with stress in the past, the patient may have a personality disorder. For patients with a personality disorder, surgical treatment is not recommended. The sixth is to assess the risk of suicide. Patients with suicidal ideation should be cautioned, because the stress of surgery can trigger suicidal behavior. In particular, patients who have attempted suicide or self-harm in the past could have a possibility of depressive disorder and require psychiatric evaluation and further treatment.

CLINICAL RESULTS OF ARTHROSCOPIC SURGERY IN PATIENTS WITH MENTAL DISORDERS

Jacobs et al.[14] investigated factors influencing preoperative symptoms in 64 patients who underwent hip arthroscopic surgery for labral tears. Interestingly, the patient's symptom severity was more related to the mental health status than either the size of the labral tear or femoroacetabular impingement (FAI) deformity. Also, patients with FAI and depression had higher pain levels and lower self-reported function than those without depression on initial assessment. Martin et al.[15] analyzed the effects of depression on postoperative clinical outcomes in patients who had been followed for 2 years, using a multicenter hip arthroscopic surgery registry in the United States. The study included a

total of 781 patients with a mean age of 35.8 years (standard deviation, 13 years) and 37% were women. Patients with symptoms of depression scored significantly lower on the initial 12-item international hip outcome tool (iHOT-12) and a visual analog scale (VAS) and on the 2-year follow-up iHOT-12, VAS, and rating scale of surgical satisfaction. The authors argued that the surgeon should identify depressive symptoms before surgery and be aware that they may affect the clinical outcome after surgery.

Garcia et al.[16] analyzed the effects of depression on clinical outcomes after anterior cruciate ligament reconstruction and reported that depressed patients had significantly lower self-reported functional scores at baseline and 1 year postoperatively. They also argued that interaction and counseling between the physical therapist and the patient may occur during the course of rehabilitation. Rosenberger et al.[17] argued that recovery and return to a desired level of activity after surgery can be influenced by environmental, personal, and psychological factors. Tjong et al.[18] also found that self-motivation, optimism, strong social support, and appropriate goal setting positively affected return to sports after hip arthroscopic surgery for FAI.

ARTHROPLASTIC SURGERY IN PATIENTS WITH MENTAL DISORDERS

Stone et al.[11] analyzed the effects of psychiatric diagnosis and psychotropic medication on clinical outcomes after primary total joint arthroplasty (TJA). Among 3,020 patients who underwent primary TJA from 2017 to 2018, 32.3% had a preoperative psychiatric diagnosis, and these patients were more likely to experience postoperative emergency room visits and discharge to a skilled nursing facility than patients without a psychiatric diagnosis. Also, patients with psychotropic medication had a higher rate of skilled nursing facility discharge. According to Halawi et al.'s study[19] on the psychological distress of patients who underwent primary TJA, postoperative psychological distress was high when they had preoperative depression, lived alone, smoked, or had little education, and this stress increased the length of hospital stay. In a study of clinical outcomes of patients undergoing total hip arthroplasty (THA), Schwartz el al.[20] also showed that preoperative depression was associated with postoperative medical complications, prosthetic joint infection, readmission, allogenic blood transfusion, nonhome discharge, less improvement in pain, decreased satisfaction, and high cost of care. In addition, patients with depression who did not receive psychotherapy were more likely to be discharged to an inpatient rehabilitation facility, require two or more postoperative narcotic prescriptions, continue narcotic requirements, and undergo revision at postoperative 1 and 3 years. Wilson et al.[21] selected 111,838 patients undergoing THA from the Truven MarketScan database and reported on postoperative new-onset depression. They reported that patients with new-onset depression at 1 year postoperatively was 2,517 (2.25%) and risk factors were sex, opioid use, higher Elixhauser comorbidity index, anxiety disorder, drug- or alcohol-use disorder, and smoking before surgery. In addition, new-onset depression increased the risk of postoperative prosthetic joint infection, aseptic revision surgery, periprosthetic fracture, and non-home discharge.

MENTAL DISORDERS IN TRAUMA PATIENTS

Musculoskeletal injury can affect mental and social health depending on the severity of symptoms and the magnitude of self-reported activity limitations.[22] Patients can experience both stress and distress, as well as unhelpful cognitive bias about pain, such as fear of painful movement during recovery. They can experience sadness, anger, guilt, shock, and denial. The American Academy of Orthopedic Surgeons reported that psychiatric problems, such as anxiety, depression, and posttraumatic stress disorder (PTSD), can affect clinical outcomes and should be evaluated after trauma.[22]

Pre-injury Mental Disorders

Falls account for the largest proportion of injuries in people with mental disorders, and in the United Kingdom, 3% to 15% of suicide attempts are caused by falls every year.[23-25] Most of these patients had social or economic problems.[26] In order to treat them, surgical treatment should proceed, but a multidisciplinary approach with psychiatric treatment is required after surgery.[27] In a study of 332 polytrauma patients with an injury severity score of 15 or higher, 39.2% of the patients had a mental illness before injury.[28] Also, among mental disorders, depression (22.3%) and drug addiction (16.9%) were the most common, and depression increased the risk of postoperative complications, such as acute renal failure, multiple organ failure, sepsis, deep venous problems such as thrombosis, infection, and pulmonary complications by about three times. Falls from a height are a major cause of significant trauma with high morbidity and mortality rates. Faggiani et al.[27] investigated 137 severe trauma patients injured by falls from heights. They compared two groups by classifying trauma patients as 65 suicide attempt survivors and 72

accidental fall victims. The cause of trauma in the suicide attempt survivors was mostly depression. The suicide attempt survivors included more women and falls from greater heights than accidental fall victims. That is, trauma caused by a mental disorder may more likely accompany more severe injury.

Post-injury Mental Disorders

Shelley et al.[29] conducted a survey of 160 trauma patients who visited a level I trauma center in the southwestern United States between 2012 and 2014. They reported that PTSD and depression occurred in approximately 21%–29% of patients at 1 year after orthopedic trauma, and these mental disorders were typical for patients who received ventilators, were in an intensive care unit, or had long hospital stays. Wu et al.[30] reported that, in an analysis of psychotic stress in 323 patients with orthopedics injury, the most common symptoms were sleep disorder, gastrointestinal symptoms, and anxiety; these were associated with being female and longer hospitalization. A retrospective study in China reported that among orthopedic patients admitted to the trauma ward, sleep disorder with the Pittsburgh sleep quality index > 5 was observed in 51.4%, and severe sleep disorder with a Pittsburgh sleep quality index > 10 was observed in 15.4% of the patients.[31] Moreover, they reported that sleep quality was not related to VAS. McMinn et al.[32] investigated psychological morbidity and functional impairment in pelvic trauma patients. Although pain and alcohol use decreased 1 year after trauma, PTSD and depression did not improve, and the quality of life continued to decline.

Suicide in Osteoporotic Fractures

Risk factors for suicide range from having low income and alcohol abuse to suffering from cancer, mental disorders, and chronic pain.[33-36] Among the identified risk factors, aging is a major factor influencing the suicide rate, with the rate increasing among the elderly.[37,38] Osteoporotic hip fractures and vertebral compression fractures in the elderly severely restrict patients' physical mobility because of poor functional recovery and chronic pain, increase psychological stress, and cause strain in family dynamics.[39,40] Also, a retrospective cohort study using data from Taiwan's National Health Insurance Research Database reported that hip fractures in elderly patients increased the risks of depression and dementia.[41] Jang et al.[42,43] investigated the incidence rate and hazard ratio (HR) using Cox's proportional hazard model of suicide death for elderly hip fractures and vertebral compression fractures in a Korean nationwide cohort study. During the first 180 days of follow-up in elderly patients with hip fractures, the incidence of suicide was 266.1 per 10,000 person-years. Hip fracture patients were 2.97 times more likely to kill themselves than their matched controls (HR, 2.97; 95% confidence interval, 1.32–6.69) during the same period. The increase in the risk of suicide because of hip fractures increased only for less than 1 year, which may reflect the characteristics of hip fractures with a high short-term death rate. The incidence of suicide was 116 per 100,000 person-years in spinal fracture patients during a 4.5-year follow-up. The increased risk of suicidal death also persisted for the entire follow-up period. This seems to reflect the nature of the recurrence of vertebral fractures.

An interdisciplinary approach to identifying and addressing mental health problems (anxiety, PTSD, depression, and premorbid psychiatric conditions) and social health problems (smoking, low education level, lack of social support) can help restore health after musculoskeletal injuries.[22,44] A positive emotional state, confidence in exercise, and a return to daily routine are known as the basis for optimal recovery.[45]

In conclusion, orthopedic surgeons need to assess the psychiatric medical history of orthopedic patients with mental disorders before surgery and understand the psychological and behavioral patterns of patients with mental disorders. In addition, appropriate psychiatric consultations and evaluations are necessary to prevent worsening of mental disorders before and after surgery.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ORCID

Jun-Il Yoo https://orcid.org/0000-0002-3575-4123
Yonghan Cha https://orcid.org/0000-0002-7616-6694
Jung-Taek Kim https://orcid.org/0000-0003-4243-5793
Chan Ho Park https://orcid.org/0000-0003-0409-8132
Wonsik Choy https://orcid.org/0000-0001-9020-5832
Kyung-Hoi Koo https://orcid.org/0000-0001-5251-2911

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