

# Clinical Characteristic and Psychiatric Features of Self-Inflicted Wrist Laceration: A Single Institute Retrospective Study

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**Purpose:** Self-inflicted wrist laceration is a common injury in the department of hand surgery. The aim of this study was to investigate the clinical characteristics and psychiatric features of self-inflicted wrist laceration using categorization according to wound severity.

**Methods:** We reviewed 71 patients from 2002 through 2012. All of the patients were grouped into four groups. Data regarding the following characteristics were collected: age, gender, size, structure involved, instruments used, history of previous self-inflicted injury, comorbidities in psychiatric and presentation of follow-up outpatient appointment to the department of plastic surgery and psychiatry.

**Results:** In these patients, approximately 64% of patients were female. About 80% of patients cut their wrist using a knife. And in grade 3–4 injury, percentage of glass injury was relatively high (22%), compared with other grades (3%). Unlike previous studies, patients in grade 3–4 tended to cut their wrist repeatedly. Focusing on psychiatric problems, approximately one quarter of patients had a previous history of self-infliction. In all patient groups, mood disorder was the most common disorder in patients who had a previous psychiatric disorder. But after operation, more than two thirds of patients had not visited department of psychiatry again.

**Conclusion:** We identified some other differences among their characteristics. All patients in group also should be evaluated and surgically treated properly. A multidisciplinary approach is required for patients with wrist laceration due to self-injury in comparison to those with laceration due to other causes. Because many of them have previous self-injury experiences and psychiatric disease.

**Keywords:** Self mutilation, Wrist, Laceration, Suicide

## INTRODUCTION

Self-inflicted wrist laceration is very specific type of injuries found in emergency departments. This injury to artery,

nerve and tendon can result in a reduced motor and sensory capacity. Thus these patients are problematic in terms of wound treatment. In these patients, the episode of self-wristed laceration was not only associated with a simple

condition, but it happened under in the varied environments.

Self-harm is listed in the Diagnostic and Statistical Manual of Mental Disorders as a symptom of borderline personality disorder. However many patients with other diagnoses may have depression, anxiety, schizophrenia and severe personality disorder. Fujioka et al.<sup>1</sup> investigated that these patients did not always consult a psychiatrist. They did not always undergo psychiatric treatment or receive advice because some emergency room physicians treated the wound but did not feel the need for psychiatric consultation<sup>1</sup>.

Many physicians have studied this type of laceration from a traumatologic viewpoint before now. The physician who has to deal with this type of injury must be familiar with both surgical and psychiatric aspects.

The aim of this study is to investigate clinical characteristics of self-inflicted wrist laceration from a hand surgery and psychiatric perspective. We hypothesized the patients with wounds differ from severity of wound. We considered anatomy of the wrist and classified according to a grade system related to injury depth in order to analyze clinical features. And we also compared the association with psychiatric features in these patients.

## MATERIALS AND METHODS

We reviewed the medical records of 71 patients with self-inflicted wrist lacerations who visited our plastic surgery department from 2002 through 2012. All patients were grouped by injury depth and related anatomy according to the following by our criteria: grade 1, injury involving only skin; grade 2, involving skin and additional injury to palmarislongus (PL) or flexor carpi radialis (FCR); grade 3, injury extended at the flexor carpi ulnaris (FCU), arteries or nerves; and grade 4, injury extended at the flexordigitormsuperficialis (FDS) or flexordigitorumprofundus (FDP) (Table 1).

Data regarding the following descriptive characteristics were collected: age, gender, size, structure involvement, instruments used, history of previous self-inflicted injury, comorbidities in psychiatric disorder and presentation of

follow-up outpatient appointment to the department of plastic surgery and psychiatry.

## RESULTS

During a 10-year period, a total of 71 patients with self-inflicted wrist lacerations visited in our clinic. A total of 46 patients were female and 25 ones were male. Seven patients were grouped as grade 1, 24 patients were grade 2, 21 patients were grade 3 and 19 patients were grade 4. The male to female ratio was 0.36 (25 patients):0.64 (46 patients) (Table 2). In all grades, the female ratio was higher than that of males. Self-inflicted wrist cutters were predominantly female and aged under 40 years. A total 54% of patients had consumed drinking alcohol at the time. 59% of patients cut their wrist at home.

The most common instrument was a knife in all grades. A large number of patients cut their wrist using a knife (80%). In grade 3 and 4 injury, the percentage of glass injury was relatively high (22%), compared with other grades (3%). The most common reason for self-inflicted laceration was

**Table 1.** Grade of self-wrist laceration by injury depth and related anatomy

Grade	Involvement structure
Grade I	Skin alone
Grade II	Skin, PL, FCR
Grade III	Skin, PL, FCR FCU, artery and nerve
Grade IV	Skin, PL, FCR FCU, artery and nerve FDS and FDP

PL, palmarislongus; FCR, flexor carpi radialis; FCU, flexor carpi ulnaris; FDS, flexordigitormsuperficialis; FDP, flexordigitorumprofundus.

**Table 2.** Distribution of patients by self-wrist laceration grade

Grade	Male (patient)	Female (patient)	Total (patient)
Grade I	3	4	7
Grade II	9	15	24
Grade III	5	16	21
Grade IV	8	11	19
Total (%)	25 (36)	46 (64)	71 (100)

conflict with a lover or spouse, followed by depression mood, financial problem, and illness state. Approximately one quarter of patients (17 patients, 24.9%) had a previous history of self-infliction, one of seven patients (14%) in grade 1, five of 24 patients (21%) in grade 2, five of 21 patients (33%) in grade 3, and six of 19 patients (33%) in grade 4 (Fig. 1).

A total of 28 patients had suffered from some existing psychiatric disease or been diagnosed with new ones after self-injury behavior. In grade 1, there were two patients with mood disorder and one with adjustment disorder, while in grade 2, there were eight with mood disorder and two with schizophrenia. Grade 3 included five patients diagnosed with mood disorder and two patients with adjustment disorder out of nine, while grade 4 included two patients with schizophrenia, four patients with mood disorder, and two patients with adjustment disorder. To classify them in psychiatric diagnostics, the most diagnosed disease was mood disorder, which occurred most frequently regardless of grade.

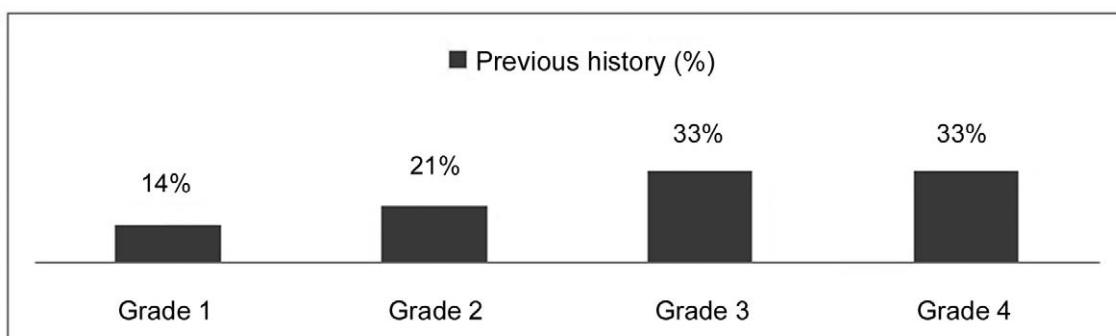
In all grade groups except grade 1 patients, who had only on skin, PL rupture turned out to be most frequent. As for the FCR, 28 patients showed some aspects of injury in that grade 2 included 10 patients with FCR rupture while grades 3 and 4 included nine, respectively (Table 3). As for the FCU, we had ruptures from 16 patients to the effect that grade 3 included 10 patients and grade 4 included six patients, who showed some aspects of damage. Patients who were classified as grade 3 or higher were accompanied by neurovascular injury, of whom 13 were radial artery rup-

ture patients while six were ulnar artery rupture patients. As for patients with median or ulnar nerve damage, it was found out that grades 3 and 4 included 12 such patients, of whom five had ulnar nerve damage while seven had median nerve damage. In addition, eight patients showed damages in the superficial branches of radial nerve. Differences in average wound sizes were observed among grades, and those sizes increased as the grades rose. The average size was 4.28 cm in grade 1, 4.39 cm in grade 2, 4.90 cm in grade 3, and 6.52 cm in grade 4. In grade 1, two patients underwent surgery under general anesthesia; however, the remaining patients underwent operations with local anesthesia. Also in grade 2, 10 patients underwent explorations under general anesthesia while 14 underwent operations with local anesthesia; however in grades 3 and 4, all but five patients were subject to operations under general anesthesia. Arteriorrhaphy, tenorrhaphy, and neurorrhaphy were performed respectively in accordance with the types of involvement structures.

Of the seven patients in grade 1, three (42.9%) were exam-

**Table 3.** Distribution of patients by involvement structures

Involvement structures	No. of patients
Palmarislongus	46
Flexor carpi radialis	28
Flexor carpi ulnaris	16
Radial artery	13
Ulnar artery	6
Median nerve	5
Ulnar nerve	7
Superficial branches of radial nerve	8



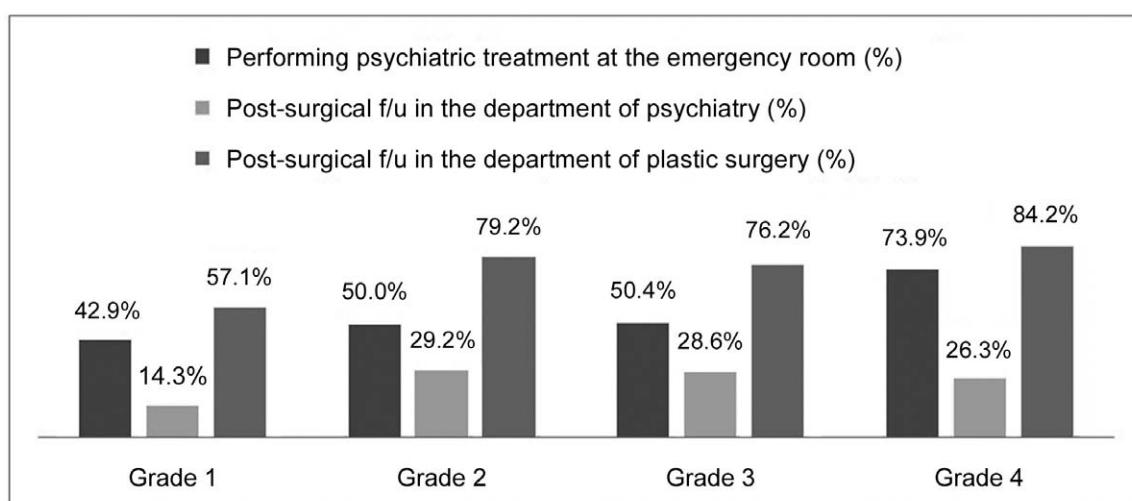
**Fig. 1.** Previous history of self-inflicted wrist laceration patients (%): approximately one quarter of patients had a previous history of self-infliction.

ined by psychiatrists in the emergency room, of whom only one patient has since been followed up through outpatient treatment in the department of psychiatry, while in the department of plastic surgery, four (57.1%) have since been examined through outpatient visit. Of the 24 patients in grade 2, 12 (50%) received psychiatric treatment in the emergency room, and seven (29.2%) of them were followed up through outpatient treatment in the department of psychiatry and 19 (79.2%) in the department of plastic surgery. Of the 21 patients in total in grade 3, 11 (50.4%) received psychiatric treatment in the emergency room, and six (28.6%) were followed up through outpatient treatment in the department of psychiatry and 16 (76.2%) in the department of plastic surgery, while of the 19 patients in grade 4, 14 (73.9%) were subject to psychiatric treatment in the emergency room, and five (26.3%) of them were followed up through outpatient treatment in the department of psychiatry and 16 (84.2%) in the department of plastic surgery (Fig. 2). After operation, more than two thirds of patients had not visited department of psychiatry again.

## DISCUSSION

Maloney et al.<sup>2</sup> claimed that most case of self-inflicted laceration was highly likely to occur repetitively in young men, approximately 45% of the patients have a psychiatric history, and 1/4 or more have higher risk of suicide. Rashid and

Brennen<sup>3</sup> suggested that the gender ratio of males to females is approximately 2:1. From the results of our study, it had been found that the gender ratio between males and females is about 0.36 (25 patients):0.64 (46 patients). As for ages of the patient groups, it was observed that they do not differ significantly in average age, and, in general, the number of patients under 40 (77%) was much higher, compared with patients age 40 or older. Drinking alcohol was frequently involved in situations of self-injury, and many cases occurred at home. It was believed that this was because self-injury behavior was related to getting rid of tension and drinking behavior was also associated with such expressions of feelings. As for weapons used for self-injury behavior, knife injuries were the most common in every grade, however, the proportion of glass induced injuries was much higher in grade 3–4 patients. We suggest that this was because there could be many more significant injuries than assumed since the edges and surface of glass fragments were much sharper than those of knives. For analysis of the causes of the patient's attempts at suicide, conflicts with spouses or lovers in some relation accounted for the greatest part, followed by mood disorder, economic problems and disease. Although this study was conducted depending primarily on medical records of self-injury behavior documented at the moments of the patients' visit as this study was a retrospective research study, we expect that we will be able to perform a deeper analysis of the characteristics of



**Fig. 2.** Psychiatric and plastic surgery department follow-up arrangements (%): after operation, more than two thirds of patients had not visited department of psychiatry again. f/u, follow-up.

patients with self-inflicted wrist laceration if we have detailed psychological analyses regarding the patients and sufficient interviews by psychiatric experts.

A quarter of such patients with self-inflicted wrist laceration proved to have previous experience in attempting such laceration. Although the study reported by Fujioka et al.<sup>1</sup> suggested that patients with superficial injuries show much more repetitive self-injury behavior than patients with deep injuries, such a tendency was not observed in this study, but rather, it is believed that their claim should be subject to further research since approximately one third of patients in grades 3 and 4 show some repetitive tendency. The most prominent feature of characteristic was that they were accompanied with more psychiatric problems than other patients with different kinds of laceration. Research showed that 46% of patients visiting the emergency department and the department of plastic surgery had received psychiatric diagnosis. According to Goldwyn et al.<sup>4</sup>, there appeared to be no relation between the seriousness of damage and psychiatric problems in patients with self-inflicted wrist laceration, and mood disorder and schizophrenia are the most common underlying diseases. Showing results consistent with that tendency, our study also reports that mood disorder was the most common psychiatric underlying disease regardless of grades.

Given that the higher the grade, the greater the size of wounds, it is believed that it was because the size of wounds became necessarily longer and the accompanying neurovascular injuries increase as the patient's injuries become more distant from the central PL as injuries in radial and ulnar nerves were more frequent in grades 3 and 4, where nerves and arteries have greater relative involvement. Thus, in evaluation of wounds, one should keep in mind that there can be neurovascular injuries necessarily in the case of laceration on the lateral sides, and management can be arranged after careful sensory examination of ulnar and radial nerves before establishment of appropriate anesthesia and an operation plan, considering that a considerable number of patients visit hospitals while in a drunken state.

As a result of the analysis of the involvement structures due to self-inflicted wrist laceration, this study showed that damage in the PL, a superficial structure, was most com-

mon. While the literature by Jaquet et al.<sup>5</sup> and other previous studies claimed that injuries were more common on the ulnar side than on the radial side, it was found from the results of our study that greater damage to structure of radial nerve, radial artery, and the FCR occurred on the radial side. It is believed that this was because patients were easily able to inflict injury on the radial side since it was anatomically more natural to give cause damage to structures in the radial side than to inflict injury on the ulnar side, given that most damages occurred on the volar side of a wrist with weapons such as a knife.

In repair of specific structures, tenorrhaphy, skin suture etc., were performed under local anesthesia when the wounds were judged as grade 1 or 2 at the initial examination in the emergency department. Except for two patients who would not cooperate, local anesthesia worked well in the case of grade 1, and 10 out of 24 grade 2 patients underwent general anesthesia for sufficient exploration because damage on other structures was suspected. Under correct physical examinations, we can tell that recovery of the damaged structure under local anesthesia is important in the case of grade 1 and grade 2 wounds. However, sufficient exploration should be necessarily arranged under general anesthesia when grade 3 and 4 neurovascular injuries or damage in cardinal structures are suspected. Only when such early physical examinations and judgments are made correctly, appropriate management will be administered for patients.

Taking a look at the proportion of psychiatric treatments in the emergency department at the time of the patients' visits, we can tell that the proportion was higher with higher grades. It is believed that this was because the more serious a wound injury, the higher the rate of recognition of the necessity of psychiatric treatment by medical staff members. Most patients visiting hospitals for self-inflicted wrist laceration show very low levels of compliance with psychiatric examination because they have low levels of treatment compliance, and reject their own self-injuries or tend to fail to cooperate with medical staff members.

The proportion of patients who underwent follow-up to the department of psychiatry turned out to account for 30% or lower in every grade. Comparatively, given that the rate

of patients who underwent follow-up to the department of plastic surgery after operations was shown to increase as the grades rose, we can tell that the more serious the injury, the higher the rate of patients who visited the hospital for outpatient treatment. In consideration of this finding, while it is important to recommend a psychiatric evaluation by an initial physician or a hand surgeon at the emergency department, one should positively recommend further psychiatric evaluations and proper management for patients who have not undergone psychiatric examination in the emergency department when they visit the department of plastic surgery for the purpose of wound management after operations. Although it has not been carried out in this study, it is believed that in management of patients with self-inflicted wrist laceration because they do not undergo psychiatric evaluation, despite of necessity, it is important to work on motivations or backgrounds. Thus, when patients with self-inflicted wrist laceration arrive at the emergency department, we should not only concentrate on the evaluation and management of wounds but also have them psychiatrically examined and arrange more special care, including cooperative treatment for patients.

## CONCLUSION

Self-inflicted wrist laceration patients were grouped by injury depth and related anatomy. We identified some other differences among them. All patients in group should be evaluated and treated properly. And the various stresses have recently increased, the number of patients with self-inflicted laceration will increase. A multidisciplinary approach is required for patients with wrist laceration due

to self-injury in comparison to those with laceration due to other causes. Because many of them have previous self-injury experiences and psychiatric disease, it is desirable to administer psychiatric treatment in an initial stage when they arrive at the emergency department or visit outpatient sectors. Conduct of various studies on this issue is also desirable as different properties are shown in different levels of damage and different depths of wounds in patients. In addition, some methods for increasing patients' levels of compliance should be considered for the purpose of preventing recurrence and administration of appropriate treatment. All members of the staff, including surgeons should make diverse efforts to perform appropriate management for patients when they visit the hospital.

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# 자해로 인한 손목 열상의 임상적 및 정신과적 특성의 분석: 단일 기관의 후향적 연구

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**목적:** 수부외과 영역에서 자해로 인한 손목열상 환자의 손상 정도에 따른 임상적 특징 및 정신과적인 특성을 분석하였다.

**방법:** 2002~2012년까지 71명의 환자를 손상 정도에 따라 4그룹으로 분류하여 중등도에 따라 다양한 임상적 특징 및 자해의 경험이나 정신과적 동반질환 유무와 정신과 추시된 환자의 비율을 분석하였다.

**결과:** 전체 64%의 성별은 여자였고, 80%의 환자가 칼을 이용하였다. 3~4등급의 환자에서는 유리로 인한 손상이 전체의 22%를 나타낸 반면 1~2 등급의 환자에서는 전체의 3%가 유리로 인한 손상으로 나타났다. 열상의 등급이 높을수록 길이도 긴 경향을 보였으며 다른 연구와는 달리, 오히려 깊이가 깊은 3~4등급의 열상 환자들이 반복적으로 자해를 하는 것으로 나타났다. 전체 환자의 1/4는 이전에도 자해한 경험이 있었고 모든 환자군에서 우울증이 가장 흔한 질환으로 나타났다. 수술 후 2/3 이상의 환자가 정신과 외래 추시를 받지 못했다.

**결론:** 자해로 인한 손목열상 환자는 손상 등급에 따라 다른 특성을 보이며 이 전 자해 과거력 및 정신과적 문제가 동반된 경우가 많은 것으로 나타났다. 따라서 초기에 적절한 수술 및 정신과적 개입을 포함한 다제학적인 접근과 추시가 필요하다.

**색인단어:** 자해, 손목열상

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