

## Postoperative Psychiatric Complications in Living Liver Donors

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### ABSTRACT

**Background.** To understand the impact of psychologic variables on donor quality of life, we studied long-term data on postoperative psychiatric complications in living liver donors. This study is a focused psychological investigation of diagnoses, treatments, and long-term clinical courses of living liver donors with psychiatric complications.

**Methods.** Of the 142 donors who underwent live-donor liver transplantation at Nagoya University Hospital between April 2004 and July 2014, we investigated those without a history of mental illness who had developed such illness after transplantation and required psychiatric treatment.

**Results.** A total of 6 (4.2%) donors developed the following psychiatric complications after transplantation: major depressive disorder (n = 2), panic disorder (n = 2), conversion disorder (n = 1), and substance use disorder (n = 1). Concerning psychiatric treatment, all donors received antianxiety drugs, 3 took antidepressants, and supportive psychiatric therapy was concomitantly provided to all subjects. The average treatment period was 53.3 months. Regarding subject outcomes, 3 donors achieved remission, and the other 3 continued treatment. All subjects showed improvement in Global Assessment of Functioning Scale.

**Conclusion.** It is important to accurately diagnose postoperative psychiatric complications and provide long-term treatment in close coordination with transplant surgeons.

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**L**IVE-DONOR liver transplantation has been performed since 1988, partially because of a lack of donated livers [1]. Of all the types of medical services, surgery for organ donors is the only one without medical indications, so close attention needs to be paid to donors' health and safety. In 2000, the Live Donor Consensus Group issued a statement regarding donor protection [2] that reconfirmed that donors should voluntarily provide organs with a full understanding of the associated benefits and risks. Since the statement was issued, physicians have held discussions with donors regarding postoperative complications [3–10]. These discussions had previously focused on physical complications, but researchers also began to pay attention to psychiatric complications. In 2001, Fukunishi et al [11] reported depression in 3.4% of the subjects (4/116) after live-donor liver transplantation. In 2003, a retrospective study was conducted to investigate complications among all donors in

Japan, which found that 0.16% of them had developed depression [10]. In 2007, Trotter et al [12] conducted a multicenter study of psychiatric complications, in which 4.1% of the subjects developed mental illnesses. In 2011, a study to monitor the long-term clinical courses of donors after live-donor liver transplantation found that 8% developed mental illness [13]. In 2013, a study involving 21 countries reported that complications were noted in 24% of the subjects (n = 11,553) after live-donor liver transplantation [14]. This study did not investigate mental illness, but, among the 23 deceased donors (0.04%), 5 had committed suicide, presumably due to mental illness.

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However, in many of these existing studies, the definition of a psychiatric complication was ambiguous, psychiatrists did not provide diagnoses or treatments, and it was unknown whether donors had their mental illnesses before or after their transplantation took place [15]. This present study is a focused psychological investigation of diagnoses, treatments, and long-term (average treatment period: 53.3 months) clinical courses of living liver donors with psychiatric complications. We defined a psychiatric complication as a post-transplantation diagnosis of mental illness given by psychiatrists to a donor without a history of mental illness, who required regular psychiatric treatment both before and after discharge.

## SUBJECTS AND METHODS

### Background

At Nagoya University Hospital, approximately 20 cases of liver transplantation are performed annually. In 2004, a transplantation medical team consisting of transplant surgeons, gastroenterologists, psychiatrists, transplant coordinators, and psychologists was created, and they regularly hold interprofessional conferences.

### Procedure for Assessing Donors From a Psychiatric Aspect

In line with the ethical guidelines of the Japan Society for Transplantation, all potential donors were evaluated from both physical and psychiatric aspects after obtaining their written informed consent in the Department of Transplantation Surgery. For donor protection, psychiatric assessment was performed by independent psychiatrists and psychologists with expertise in transplantation. They investigated whether donors intended to provide their liver, and whether they fully understood the risks and benefits associated with transplantation. Their mental illnesses were evaluated through thorough history-taking and screening conducted based on the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) [16] (SCID) [17].

### Diagnoses of Psychiatric Complications

If psychiatric problems were suspected in a patient after transplantation, transplant surgeons or coordinators consulted physicians in the Department of Psychiatry. Psychiatrists with expertise in transplantation reviewed the necessity for psychiatric diagnosis and intervention. Diagnoses of mental illnesses were made based on SCID [17].

### Subjects

Of the 142 patients who underwent live-donor liver transplantation at Nagoya University Hospital between April 2004 and July 2014, our study investigated those without a history of mental illness who had developed such an illness after transplantation and required psychiatric treatment.

### Results

Table 1 shows the demographic characteristics of living liver donors. One donor has comorbid psychiatric disorder. The patient was a 19-year-old woman. She complained of depression, insomnia and hypomania. She was diagnosed with bipolar II disorder (DSM-IV-TR) [16] by the attending psychiatrist. She received appropriate psychiatric treatment and was in remission. Five years later, She was

**Table 1. Sociodemographic and Clinical Characteristics of Living Liver Donors**

Mean duration from donation to the survey (range)	1,986.0 ± 1,160.8 days (8–3,769)
Mean age (range)	36.6 ± 11.4 years (19–62)
Sex	
Male	66
Female	76
Mean operative time	463.7 ± 108.9 min
Mean amount of bleeding	477.3 ± 408.9 mL
Mean weight of the graft	477.3 ± 205.5 g
Graft type	1. Lateral segment 33.1% (n = 47) 2. Left lobe 14.1% (n = 20) 3. Right lobe 52.8% (n = 75)
Mean duration of hospitalization days from donation to leaving the hospital	16.4 ± 6.3 days
Comorbid psychiatric disorder	Bipolar II Disorder (n = 1)
Relationship of donor to recipient	Parent to Child 40.1% (n = 57) (Father to Child n = 23, Mother to Child n = 34) Child to Parent 26.1% (Child to Father n = 18, Child to Mother n = 19) Spouse 22.5% (n = 32) (Husband to Wife n = 13, Wife to Husband n = 19) Sibling 4.9% (n = 7) Grandparent to Grandchild 2.1% (n = 3) Uncle to Nephew 1.4% (n = 2) Aunt to Nephew 1.4% (n = 2) Sister-in-law to Sister-in-law 0.7% (n = 1) Foster daughter to Foster mother 0.7% (n = 1)
Residential status of donor and recipient	Cohabitation 70.4% (n = 100) Separation 25.4% (n = 36) Unknown 4.2% (n = 6)
Marital status	Marriage 69.0% (n = 98) Single 23.2% (n = 33) Divorce after transplantation 4.2% (n = 6) Marriage after transplantation 3.5% (n = 5)

a candidate to donate her liver to her mother who had liver cirrhosis caused by hepatitis C virus (HCV). After the physical and psychiatric assessment for the transplantation, she donated her right lobe to her mother, and 596 days after the donation, she maintained good physical and psychiatric health.

Table 2 shows the diagnosis and mortality of liver transplant recipients. The primary diagnoses of recipients were as follows: biliary atresia (n = 48), cirrhosis caused by HCV (n = 30), primary biliary cirrhosis (PBC) (n = 19), cirrhosis caused by hepatitis B virus (HBV) (n = 15), fulminant hepatitis (n = 7), autoimmune disorders (n = 4), Alagille syndrome (n = 3), hepatoblastoma (n = 3), primary sclerosing cholangitis (PSC) (n = 2), Wilson's disease (n = 2), and others (n = 9). There were 7 recipient deaths (4.9%).

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