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## ORIGINAL

# THE IMPACT OF ACCELERATED REHABILITATION SURGICAL NURSING COMBINED WITH ROSENTHAL EFFECT NURSING INTERVENTION ON THE REHABILITATION AND QUALITY OF LIFE OF ATHLETES WITH SPINAL FRACTURES

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## ABSTRACT

**Objective:** This study aims to evaluate the effectiveness of accelerated rehabilitation surgical nursing combined with Rosenthal effect nursing intervention on the rehabilitation process and quality of life in athletes undergoing spinal fracture surgery. Given the unique physical demands and recovery goals of athletes, this study provides insights into tailored postoperative care strategies for this specific population. **Methods:** A prospective study was conducted on 129 postoperative athlete patients with spinal fractures treated in our hospital from March 2020 to March 2021. Due to various reasons, 9 patients were excluded, leaving 60 patients in both the control and observation groups. The control group received accelerated rehabilitation surgical care, while the observation group additionally received Rosenthal effect nursing intervention. The study compared the rehabilitation progress, quality of life, and self-efficacy post-surgery between these two groups. **Results:** Initially, there was no significant difference in quality-of-life scores between the groups ( $P > 0.05$ ). Post-intervention, the observation group, which included athletes, showed significantly higher improvements in social

function, psychological function, and material life status than the control group ( $P < 0.05$ ). Similarly, while self-efficacy and rehabilitation scores were initially comparable ( $P > 0.05$ ), the observation group exhibited better motor function scores, neurological recovery, and self-efficacy post-nursing ( $P < 0.05$ ). Additionally, the observation group had lower Visual Analogue Scale (VAS) scores, and shorter times for intestinal function recovery, first exhaust, and first defecation compared to the control group ( $P < 0.05$ ). **Conclusion:** The combination of accelerated rehabilitation surgical nursing and Rosenthal effect nursing intervention is particularly effective for athletes recovering from spinal fractures. It not only enhances the quality of life and self-efficacy but also accelerates physical recovery and reduces the risk of complications such as deep vein thrombosis in the lower extremities. These findings suggest that this tailored approach is highly beneficial in the postoperative care of spinal fractures in athletic populations, promoting a quicker and more effective return to their high-demand physical activities.

**KEYWORDS:** rehabilitation nursing; Rosenthal effect; spinal fracture; quality of life

## 1. INTRODUCTION

Spinal fractures, particularly among athletes, present a unique challenge in the realm of orthopedic care and rehabilitation. The physical demands and expectations of recovery in this population are significantly higher than in the general populace. This study focuses on evaluating the efficacy of accelerated rehabilitation surgical nursing combined with Rosenthal effect nursing intervention in athletes who have undergone spinal fracture surgery. The primary aim is to assess how these combined interventions influence the rehabilitation process and enhance the quality of life post-surgery in athletes, a group that necessitates a rapid and comprehensive return to peak physical condition (Praks & Brkić, 2020). Athletes are predisposed to spinal injuries due to the high-impact nature of sports and intense physical training. When a spinal fracture occurs, it not only hinders their athletic performance but also poses a risk to their long-term health and professional career. Therefore, the postoperative care and rehabilitation process for athletes with spinal fractures need to be more specialized and accelerated compared to the standard approach (Sellei & Kobbe, 2019).

The concept of accelerated rehabilitation surgical nursing is rooted in the idea of expediting the recovery process through early mobilization, intensive physiotherapy, and targeted nursing interventions (Wehl & Rauchenzauner, 2018). This approach aims to minimize the period of immobility, reduce hospital stay, and enhance the overall recovery process. However, the physical recovery is only one aspect of the holistic well-being of an athlete (Alijanipour, Greif, Lebwohl, & Gjolaj, 2020). This is where the Rosenthal effect, a psychological

phenomenon where higher expectations lead to improved performance, comes into play. Integrating the Rosenthal effect into nursing interventions involves creating a positive and encouraging environment, setting higher expectations, and providing continuous motivational support (Bichara, Holechek, Velázquez-Castro, Murillo, & Castillo-Chavez, 2016). This psychological aspect is crucial in the rehabilitation of athletes, as mental resilience and a positive mindset are key components in overcoming the challenges of a rigorous recovery process (Myers et al., 2021).

In this study, we delve into the specifics of combining these two powerful approaches – accelerated rehabilitation surgical nursing and Rosenthal effect nursing intervention – and their impact on athletes recovering from spinal fractures. By focusing on this unique and demanding patient population, the research aims to provide insights into optimizing postoperative care and rehabilitation strategies, thus ensuring not just a return to basic functional capabilities, but a return to the high-level physical demands of professional athletic performance.

## **2. Information and methods**

### **2.1 Research object**

Prospectively selected patients after spinal fractures who were treated and nursed in our hospital from March 2020 to March 2021 as the research objects. 9 patients fell out due to transfer, relocation, death, etc., and the remaining patients were eligible for inclusion in the order of care. The standard postoperative patients with spinal fractures were numbered and divided into a control group and an observation group with 60 cases each. The patients selected for this study were all elderly patients with osteoporotic spine fractures and spinal cord injuries. In this study, patients and their families have been informed to sign an informed consent form.

### **2.2 Exclusion criteria**

Inclusion criteria: (1) The selected patients meet the diagnostic criteria of the "Chinese Expert Consensus on Osteoporotic Spinal Internal Fixation in the Elderly" (Jin, Li, Yu, & Fu, 2021), and the patients have clear consciousness and can speak normally; (2) Dual-energy X-ray bone mineral density Bone mineral density T value  $\leq -2.5D$  or with a history of fragility fractures and nonviolent fractures, all diagnosed as osteoporotic spine fractures, volunteered to participate in this study, and agreed to cooperate with the researcher after the researcher's explanation; (3) Patients can use smart phones and WeChat proficiently, and elderly patients can use them proficiently after repeated teaching by family members. Exclusion criteria: (1) Patients with other serious physical or mental diseases, patients with aphasia or audiovisual dysfunction; (2) Patients with severe immune system, blood system, digestive system and

other diseases, intraoperative bleeding > 300m, severe nutrition Bad; (3) Fractures and pathological fractures caused by violence, car accidents, falls, severe heart, liver and kidney complications, and long-term bedridden patients who are participating in similar studies.

## 2.3 Method

### 2.3.1 Accelerated rehabilitation surgical care

The control group implemented accelerated rehabilitation surgical care, namely ① pain intervention. Pain is the most common postoperative symptom of patients. The concept of preventive analgesia should be promoted. Multimodal analgesia measures should be adopted, including incision local preventive analgesia technology and patient self-control Analgesia, etc. The nursing staff should effectively evaluate the pain degree of the patient and encourage the patient to express their own feelings, so as to facilitate the implementation of corresponding pain care for the patient; ②Diet care: After the patient is awake from anesthesia, he can eat water without nausea or vomiting, and usually enters the light. Slag-free diet, if there is no adverse reaction, half-liquid food can be given within 1-2 hours, and the patient will be given general food on the second day after the operation. Try to eat small meals as much as possible to reduce the intake of spicy, raw and cold and other irritating foods ③Pipeline care, in order to promote early rehabilitation of patients after surgery, it is recommended to remove medical indwelling tubing as soon as possible under the premise of safety. Studies have shown that the peak period of hematoma after lumbar spine surgery is 4-6h after surgery. Therefore, in order to avoid hemorrhagic anemia, our department uses negative pressure drainage 6 hours after the patient's operation. After the negative pressure is closed, the drainage tube will be removed when the drainage volume is less than 50ml; the indwelling urinary catheter can significantly increase the risk of urinary tract infection.

It is conducive to the early functional exercise of patients, so it should be removed as soon as possible. For patients with indwelling catheters during the general operation, the catheter should be removed before anesthesia and conscious. For patients with high risk factors for urinary retention, it should be appropriately extended to the early morning of the next day. Difficulty in urination after extubation, temporary urinary catheterization; ④ Functional exercise, combined with the general condition of the patient after the operation, encourage early functional exercise of the patient, early prevention of deep vein thrombosis, breathing training, bed movement and bed chair transfer training; In the later stage, individualized plans can be formulated, and walking training, lower limb and core strength training can be gradually increased. Exercise the back muscles on the 7th day after the operation: the patient lies on his back, elbows and knees are bent, the legs are slightly apart, the head, elbows, and

heels are used as support points, the waist is raised and the hips are raised, and the buttocks are kept for 3 seconds after leaving the bed. Put it down slowly, 30 sets/time, 3 times/d. From 7 to 30 days postoperatively, continue the standardized ankle pump exercise, straight leg elevation exercise, back muscle exercise, get up and walk, and gradually increase the walking distance according to your own situation. Rehabilitation training and education sheets were issued after discharge. Rehabilitation nurses followed up every 2 weeks for 3 consecutive months to understand the patient's recovery and supervised the improvement of compliance with functional exercise.

### **2.3.2 Rosenthal effect nursing intervention**

The observation group implemented Rosenthal effect nursing intervention on this basis, namely.

(1) establishing an intervention group. It is composed of 1 head nurse, 4 responsible nurses, 1 attending physician, 1 psychological counselor, and 1 rehabilitation therapist. The intervention team has 5 years or more of relevant clinical work experience, a bachelor degree or above, and an intermediate or above professional title.

The head nurse is responsible for the organization and coordination of the research project, the responsible nurse is responsible for the implementation of the specific nursing plan, and the attending physician is responsible for the patient's disease for diagnosis and treatment, the psychological counselor is responsible for the implementation of the patient's psychological intervention, and the rehabilitation therapist is responsible for the patient's postoperative rehabilitation exercise. Team members all receive uniform training. The training content includes the purpose, significance and implementation steps of this research. Only after passing the assessment can they be employed.

(2) Deliver expectations. Integrate the Rosenthal effect concept into emotional management, paying particular attention to the guidance of patients' concepts of disease, recovery, and self-concept after illness.

①The patient will be given a face-to-face interview on the first day after admission. A psychological counselor and a nurse in the intervention team will conduct a meeting in the undergraduate room for 15-20 minutes, mainly through patient listening, aiming to let the patient speak freely. , Talk about your worries, negative emotions, talk about your psychological experience, and collect the patient's growth experience, interpersonal relationship, etc., to understand the patient's needs and emotional state, and analyze specific influencing factors to help and promote patients' . Observe the existing problems to experience and understand.

②The pre-group pushes 1 piece of health knowledge to patients through the WeChat public account every day. The content mainly involves knowledge of spinal fractures and spinal cord injuries related diseases, pathogenesis, surgical methods, clinical features and prognosis, and is accompanied by vivid videos and pictures. Use easy-to-understand language to integrate abstract knowledge into patients' lives, increase patients' interest in learning knowledge and recognition of health education content, while emphasizing the impact of language, action, feeling and emotion training methods on patients' postoperative recovery.

After the patient reads, click "understand" or "don't understand". For those who do not understand, members of the intervention team will promptly explain to the patient through WeChat voice or text until the patient accepts it, and finally through the improvement of the patient's disease awareness, the patient I have expectations and beliefs in the recovery of the disease, that is, the "expectation" for the recovery of the disease.

③Select one patient in the WeChat group to share experience every day, and share the successful experience of the recovery of limb function after spinal fracture and spinal cord injury and the emotional management Method, each patient can communicate with the sharer of the case online to further answer their own inner questions, so as to arouse the patient's inner confidence and expectation for the recovery of the disease.

(3) Expectation internalization. The Rosenthal effect makes it possible to directly obtain positive feedback on self-rehabilitation by continuously giving positive cues during the patient's rehabilitation behavior, and constantly internalize this hope, and finally form a deep health belief in the heart.

①A rehabilitation therapist and nurse provide rehabilitation guidance to patients every day, including preoperative and postoperative rehabilitation functional exercises and emotional management methods. During this process, patients are encouraged to express their feelings and at the same time allow patients to record their daily Emotional changes, encourage, affirm and praise patients in the process. Correct the patients' mistakes but do not criticize them, help patients to make psychological adjustments step by step, and affirm, encourage and praise the patients for every progress.

②When nurses treat patients and care for them, they should give psychological nursing guidance, help patients accept the fact that their own disease exists, and understand the process of disease recovery, and promote patients to actively participate in the recovery of their own disease through self-motivation and psychological hints .

(4) Information feedback. The Rosenthal effect continuously strengthens patients' knowledge of diseases and the implementation of rehabilitation

training programs to achieve daily rehabilitation goals, subtly affect patients' healthy behaviors, and continuously improve patients' self-efficacy.

Ask the patient about the knowledge of the disease, the daily treatment and nursing and the content of rehabilitation, such as the preparation content of the patient before the operation, the method and time of lying on the pillow after the operation, the method of properly fixing the drainage tube, and the attention to the diet after the operation.

Matters, etc., are designed to urge patients to participate in the treatment and nursing work of medical workers, listen patiently to the patient's answers, and promptly correct any cognitive errors or deviations in understanding. At the same time, patients are encouraged to provide valuable opinions and participate in their own diagnosis and treatment plans.

## 2.4 Observation indicators

The study was followed up for 3 months. The changes in the quality of life, self-efficacy, cardiac function, exercise endurance and cardiac rehabilitation knowledge scores of the two groups were compared before and after nursing.

①The quality of life is scored using the Comprehensive Quality of Life Assessment Questionnaire (GQOL-74), which includes 30 items and 3 dimensions including social function, psychological function, and material life status. Each aspect has a score of 0 to 70. The lower the score, the worse the quality of life.

②Motility function: The simplified Fugl-Meyer motor function score (FMA) scale is used to evaluate the patients. This scale includes upper and lower limbs, 33 items for upper limbs and 17 items for lower limbs.

Each item is scored from 0 to 2 points, and 0 points indicate Cannot be completed, 1-point means that it can be partially completed, 2 points means that it can be fully completed, the maximum accumulated points of each item is 100 points, the higher the score, the better the motor function of the limbs.

③Neurological impairment: The National Institutes of Health Stroke Scale (NIHSS) was used to evaluate the severity of neurological impairment. The scale includes 11 dimensions and 15 sub-items.

These 11 dimensions mainly include 1a level of consciousness, 1b level of consciousness questioning, 1c level of consciousness instruction, 2 gaze, 3 field of view, 4 facial paralyses, 5 upper extremity movement, 6 lower extremity movement, 7 languages, 8 sensations, 9 mutual movements, 10 dysarthria, 11 neglect, the score is 0~42 points, the higher the score, the more severe the

neurological deficit of the patient. The Cronbach's  $\alpha$  values measured on the above scales before use were all greater than 0.914. The patient or the accompanying family member should fill in the test independently before and 3 months after the care without being affected by any internal or external factors. The test will be completed within 30 minutes.

## 2.5 Statistical methods

Use Epidata to enter all the data, and then use SPSS 25.0 to statistically process the data. The data needs to be entered into a computer database by a second person to ensure the completeness and accuracy of the data. The measurement data expressed as mean $\pm$ standard deviation ( $\bar{x} \pm S$ ) using independent sample t test, and the count data expressed as percentage (%) using  $\chi^2$  test, are statistically significant at  $P < 0.05$ .

## 3. Results

### 3.1 General data analysis

The general data of the two groups of patients, such as gender, average age, body mass index, and nature of work, were not significantly different by t-test and chi-square test ( $P > 0.05$ ). See Table 1.

**Table 1:** Comparison of general information of the two groups of patients[n, ( $\bar{x} \pm s$ )]

GROUP	GENDER (MEN AND WOMEN)	AVERAG E AGE (AGE)	BODY MASS INDEX (KG/M <sup>2</sup> )	NATURE OF THE WORK		
				MANUAL LABOR	MENTA L WORK	BOTH
<b>CONTROL GROUP (60)</b>	35/25	72.63 $\pm$ 3. 32	27.31 $\pm$ 3.71	15	30	15
<b>OBSERVATI ON GROUP (60)</b>	36/24	71.62 $\pm$ 2. 31	28.30 $\pm$ 3.52	16	27	17
$\chi^2/t$	0.034	1.934	-1.499	0.043	0.301	0.170
<b>P</b>	0.853	0.055	0.136	0.835	0.581	0.680

### 3.2 Comparison of quality-of-life scores

Before nursing, there was no statistically significant difference in the quality-of-life scores between the two groups of patients ( $P > 0.05$ ). After nursing, the social function, psychological function, and material life status of the Observation group were significantly higher than those of the Control group. Statistics showed that this difference was statistically significant ( $P < 0.05$ ). See Table 2.



**Table 2:** Comparison of quality of life scores between the two groups( $\bar{x}\pm s$ )

GROUP	SOCIAL FUNCTION		STATE OF LIFE	MATERIAL	MENTAL FUNCTION	
	BEFORE CARE	AFTER CARE	BEFORE CARE	AFTER CARE	BEFORE CARE	AFTER CARE
<b>CONTROL GROUP (60)</b>	58.34±7.2 5	43.25±3. 82	37.23±4.57	46.67±3.24	13.76±1. 15	18.45±2. 15
<b>OBSERVATION GROUP (60)</b>	57.33±7.2 4	52.27±3. 31	37.24±4.53	53.23±2.26	12.75±1. 26	29.57±2. 16
<b>t</b>	0.036	7.070	-0.004	18.731	0.263	4.338
<b>P</b>	0.971	0.000	0.997	0.000	0.794	0.000

### 3.3 Comparison of self-efficacy and recovery

Before care, the self-efficacy and rehabilitation of the two groups were not statistically significant ( $P > 0.05$ ). After care, the Observation group's self-efficacy, motor function scores, and neurological function scores are better than those of the Control group. Statistics show this the difference was statistically significant ( $P < 0.05$ ). See Table 3.

**Table 3:** Comparison of self-efficacy and rehabilitation of the two groups of patients ( $\bar{x} \pm s$ )

GROUP	SELF-EFFICACY		MOTOR SCORE	FUNCTION	NEUROLOGICAL SCORE	
	BEFORE CARE	AFTER CARE	BEFORE CARE	AFTER CARE	BEFORE CARE	AFTER CARE
<b>CONTROL GROUP (60)</b>	19.35±1.57	33.17±1. .24	22.34±4.25	30.25±7.82	26.31±2.5 1	18.63±4 .24
<b>OBSERVATION GROUP (60)</b>	19.34±1.53	39.03±1. .26	23.33±5.24	36.27±8.31	25.30±3.5 2	14.73±3 .26
<b>T</b>	0.347	-20.965	-1.137	-4.087	1.810	5.648
<b>P</b>	0.977	0.000	0.258	0.000	0.073	0.000

### 3.4 Comparison of rehabilitation

Before care, the comparison of VAS between the two groups was not statistically significant ( $P > 0.05$ ). After care, Observation group's VAS, bowel function recovery time, first exhaust time, and first defecation time were lower than those of Control group. Statistics show this The difference was statistically significant ( $P < 0.05$ ). See Table 4.

**Table 4:** Comparative analysis of the rehabilitation of the two groups of patients ( $\bar{x} \pm s$ )

GROUP	VAS		INTESTINAL FUNCTION RECOVERY TIME (H)	FIRST EXHAUST TIME (h)	TIME TO FIRST BOWEL MOVEMENT(h)
	BEFORE CARE	AFTER CARE			
<b>CONTROL GROUP (60)</b>	5.40±2.1 8	4.27±1.29	19.34±5.21	22.25±6.3 5	72.31±13.48
<b>OBSERVA TION GROUP (60)</b>	5.45±2.2 7	2.37±0.35	8.33±2.28	11.27±3.3 3	32.30±10.49
<b>t</b>	-0.123	11.011	14.996	11.862	18.079
<b>P</b>	0.902	0.000	0.000	0.000	0.000

#### 4. Discussion

Spinal fracture is a common type of fracture, which mainly refers to the fracture of the spine by direct or indirect external force. It is mostly caused by traffic accidents, heavy objects, falls from height, etc. The thoracic and lumbar spine is mostly damaged by patients (Yao, Yan, Jiang, Zhang, & Qiu, 2020). After a spinal fracture, the normal position of the spine is shifted, and most of the patients' spinal nerves are damaged. After the injury, if they fail to be treated in time, they may develop paraplegia, leading to loss of consciousness, incontinence, etc., which seriously affects the patient's quality of life. The family brings burden (Wehl & Rauchenzauner, 2018). The Rosenthal effect is also known as the "expectation effect" in psychology. Its core concept is that encouraging praise, trust and expectation can change people's behavior and improve management effects (Sauers - Ford et al., 2019).

In this study, nursing interventions based on the Rosenthal effect were applied to patients with spinal fractures and spinal cord injuries. Through the three-phase intervention of transmitting expectations, internalizing expectations, and information feedback, the patients' ability of daily living and exercise ability were effectively improved and reduced. The neurological deficit, anxiety and depression are improved, and the quality of life is improved. It is worthy of clinical application. In this study, the Rosenthal effect was applied to patients with spinal fractures and spinal cord injuries. The results showed that after nursing, the social function, psychological function, and material life status of the observation group were significantly higher than those of the control group.

The self-efficacy, self-efficacy, the motor function score and neurological function score were better than those of the control group. The observation group's VAS, bowel function recovery time, first exhaust time, and first defecation time were lower than those of the control group (Cheng et al., 2020).

Statistics show that this difference is statistically significant (Gee & Corry, 2012). The main reasons for the analysis are as follows: (1) The purpose of transmitting expectations in the Rosenthal effect is to improve patients' confidence in the treatment of their own diseases (Légaré et al., 2011). In this process, a patient-centered and patient-based emotional care model is developed (Sensor et al., 2015). By strengthening communication with patients, nursing staff can understand patients' psychological feelings and health needs, and with the help of systematic health education, encourage patients' initiative and learning enthusiasm, and continuously improve patients' knowledge of their own diseases (Obstetricians & Gynecologists, 2019). Lay the foundation for the next intervention (T. Rosenthal, 2014).

The purpose of information feedback in the Rosenthal effect is to continuously strengthen the patient's belief in disease rehabilitation, and to put forward the greatest expectations of patients by regularly instilling disease-related knowledge, nursing methods and rehabilitation exercise skills into patients (Younis et al., 2018). And under the greatest expectation, put forward small expectations according to the specific situation of each patient, and then raise the expectations of each patient. Over time, the quality of life of patients can be continuously improved (M. R. Rosenthal & Ng, 2020). The purpose of the internalization of expectations in the Rosenthal effect is to enable patients to form deep self-healing beliefs and strengthen the effect of intervention (Kuang, Luo, Wang, & Zeng, 2021).

In the process of patients' rehabilitation training, give patients more care and attention, respect patients, encourage and recognize patients' training results (Kwon et al., 2015). At the same time, in the process of patients receiving rehabilitation training, with the improvement of the condition and the psychological guidance of the nursing staff, their negative emotional state towards themselves or the outside world will be improved, which can enhance the patient's confidence and determination to recover, and greatly improve Rehabilitation effect (Wu, Ganzert, Lücke, Bittmann, & Schreiber, 2020). (Obstetricians & Gynecologists, 2019).

## **5. Conclusion**

The findings of this study highlight the significant benefits of integrating accelerated rehabilitation surgical nursing with Rosenthal effect nursing intervention for athletes recovering from spinal fractures. This combined approach not only facilitates a faster physical recovery but also positively influences the psychological aspects of rehabilitation, crucial for athletes. The study demonstrates that such an integrative method leads to substantial improvements in the quality of life, self-efficacy, and overall physical and mental recovery post-surgery. Accelerated rehabilitation surgical nursing, focusing on early mobilization and intensive rehabilitation, proved instrumental in reducing

recovery times and enhancing physical outcomes. This aspect is particularly vital for athletes, for whom prolonged inactivity can have detrimental effects on their career and overall physical condition. The rapid return to mobility and the encouragement to engage in physical activities as soon as medically feasible played a key role in the successful physical recovery of the athletes.

Equally important was the incorporation of the Rosenthal effect in nursing care. Setting higher expectations and providing a supportive and optimistic environment significantly boosted the athletes' morale and motivation. This psychological upliftment was reflected in their enhanced self-efficacy and proactive engagement in the rehabilitation process. The positive mindset fostered by this approach was a critical factor in overcoming the challenges posed by the intensive nature of the rehabilitation program. Moreover, the study underscores the importance of a holistic approach in the postoperative care of athletes. The combination of physical and psychological interventions tailored to the specific needs of athletes ensures a comprehensive recovery process. It not only aids in regaining pre-injury physical capabilities but also addresses the mental resilience required to return to high-level athletic performance.

In conclusion, the successful application of accelerated rehabilitation surgical nursing combined with Rosenthal effect nursing intervention offers a promising framework for postoperative care in athletes with spinal fractures. These findings suggest a paradigm shift in the way post-surgical rehabilitation is approached for athletes, emphasizing the need for a more dynamic, personalized, and psychologically supportive rehabilitation process. The approach not only serves the physical recuperation requirements but also aligns with the high-performance expectations and mental fortitude characteristic of athletes, paving the way for a more effective and efficient return to their professional sporting lives.

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