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Nursing Care of the People with Physical Disabilities Undergoing Flap Surgery: A Case Report

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Abstract

Nursing care provided to persons with disabilities is vital as healthcare needs of these individuals are higher than other patients. This case report presented information on nursing care provided before and after flap surgery to a 30-year-old male with physical disability due to the fall from height when he was 22 years old. The patient was admitted to the hospital due to a burn wound that occurred 2.5 years ago, which resulted in loss of sensation in his left foot. Based on the tomography results, flap surgery was planned for the wound site. In addition to urinary incontinence, constipation, and neurological problems caused by spinal cord injury, the patient suffered from anxiety and pain due to flap surgery, which, in turn, increased his need for care. We conducted face-to-face interviews and used Gordon's functional health patterns model to identify the patient needs so that the best patient care could be provided. This model guides the health professionals to collect systematic and standardized data on 11 functional health patterns.

Keywords: Spinal cord injury, persons with disability, surgery, nursing care, functional health patterns

Introduction

Turkey's Disability Act defines a person with disability as "the person who has difficulties in adapting to the social life and in meeting daily needs due to the loss of physical, mental, psychological, sensory and social capabilities at various levels by birth or by any reason thereafter and who therefore need protection, care, rehabilitation, consultancy and support services." The legislation states that biological, physical, psychological, and social needs of the people with disabilities should be taken into account while providing healthcare.[1]

Healthcare needs of the people with disabilities are higher than the other people.[2] Compared to other health professionals, nurses hold an important place in providing healthcare to these people.[3] They evaluate the needs of disabled persons, implement the necessary nursing interventions, and make decisions to promote patient well-being. In other words, nurses play a key role in the treatment of people with disabilities and the protection and enhancement of their health.[4] Reducing the disabled persons' level of dependency at the hospital environment and helping the disabled people and their relatives in care are among the roles and responsibilities of nurses.[3-5]

Spinal cord injury is a critical central nervous problem classified among the costliest diseases.[6] According to the World Health Organization (WHO), between 250 000 and 500 000 people around the world suffered from spinal cord injury in 2013, resulting in substantial individual and societal costs.[7] A study on the barriers to empowering people with spinal cord injury reported that the failure in providing sufficient healthcare service was one of the three barriers.[8] Within this context, the evaluation of the healthcare needs of people with spinal cord injuries and providing high-quality care may not only enhance their health but also contribute to the domestic economy.

Gordon's model of functional health patterns (FHPs) is one of the frequently used models in nursing processes.[9] Developed by Marjorie Gordon in 1987, the model is recommended as a guide to constructing a comprehensive nursing database.[10] As early as 1965, it was reported that the clinical decisions were based on intuition and hard to be verified so

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a database for evaluation was required. The attempts to construct a structured evaluation framework have continued for a long time. In the recent few decades, the FHP facilitated decision-making, guided nursing care, and contributed to the standardization of data collection.[11,12] Using the FHP model in nursing care helps nurses to collect and organize data in a systematic way and provide healthcare with a holistic approach.[9] The model proposed 11 interdependent functional categories that interacted with each other.[11] (Table 1). This case report planned the nursing care according to Gordon's FHP model, which was provided to a disabled person undergoing flap surgery.

Case Presentation

Sociodemographic Characteristics

Mr. E. B. is a disabled person, who was 30 years old, married, and had two children. The patient had been employed in a position for disabled individuals in a private firm since 2008.

Previous Health History

After falling from height in 2002, the patient had spinal cord injury at the L3-L4 (lumbar) level and sensory and motor loss from below the knees to toes in both legs. The patient occasionally had urinary incontinence and constipation problems.

Current Health History

In 2013, the patient visited the hospital since his feet were contacted by a hot radiator all night, resulting in a non-healing burn wound on his left foot and occasionally a smelly discharge from the wound (Figure 1). He had visited the hospital due to the burn wound but the wound dressing had not been effective for treatment. Tomography results demonstrated osteomyelitis in the calcaneus of his left foot with a burn wound.

Table 1. Gordon's Functional Health Patterns

1. Health perception-health management–describes the patient's perceived health and well-being and behaviors used to manage health and wellness
2. Nutrition metabolics–describes food and fluid intake relative to metabolic need
3. Elimination–describes a pattern of excretory function (bowel, bladder, and skin)
4. Activity/exercise–describes exercise pattern, energy to carry out routine activities each day, tolerance, leisure, and recreation
5. Sleep/rest–describes a pattern of sleep, rest, and relaxation
6. Cognitive perception–describes a sensory-perceptual and cognitive pattern (e.g., taste, hearing, sight, smell, pain, learning style)
7. Roles and relationships–describes patterns of role engagements and relationships
8. Self-perception/self-concept–describes a pattern of self-concept and perceptions of self (e.g., body comfort, body image)
9. Sexual–reproductive–describes a pattern of patient satisfaction with sexuality and reproductive patterns.
10. Coping/stress tolerance–describes a general coping pattern and the effectiveness of related strategies used to increase stress tolerance.
11. Values/beliefs–describes values and beliefs (including spirituality) and goals used to guide choices and decisions.

Source: Jones et al (2012: 141).

Figure 1. Preoperative image of the left foot

Treatment

It took 3 weeks to receive the tomography results. Based on the results, the site with osteomyelitis was cleaned and flap surgery was planned. The patient was hospitalized on February 1, 2016, a day before the surgery. The patient stayed at the hospital for 1 week and visited the hospital 1 week after discharge for postoperative follow-up. During the follow-up, *Pseudomonas aeruginosa* was observed at the surgical site. Due to this reason, he underwent another surgery to manage flap necrosis on February 22, 2016 (Figures 2 and 3). Pathology specimen obtained from the surgical site in the first surgery showed verrucous carcinoma on February 26, 2016. Due to this finding, a below-the-knee amputation was planned. However, since the patient refused to undergo surgery at a hospital away from his hometown, he was referred to a hospital in his hometown. Three months later, we phoned the patient and learned that he was amputated and his health was good. We informed the patient about the case presented and obtained written and verbal informed consent.

This case report presented information about the nursing approaches to be implemented in patients with disabilities, who underwent flap surgery and the results of these approaches. We used Gordon's 11 FHPs, which standardizes data collection and diagnosis in nursing care planning.[13]

Physiopathology

Spinal cord injury may result from the direct impact of a fast-moving object hitting the spines or the movement of the spine beyond its physiological limits. These injuries are mostly related to compression, flexion, extension, or rotation. Based on their reasons, thoracic and lumbar spinal injuries may be classified as wedge compression fracture, burst fracture, fracture-dislocation, and seat belt injury. These injuries mostly cause breakage of the vertebral ring and obstruction of the spinal canal. The pathophysiology of spinal cord injuries has two phases, namely the primary phase and the secondary phase. The primary phase involves the first mechanical injury during which force is imparted to the spinal cord disrupting axons, blood vessels,

Figure 2. Postoperative image of the left foot after flap surgery.

Figure 3. Image of the left foot during the recovery period.

and cell membranes. This phase is followed by a delayed period of tissue deconstruction, which involves vascular dysfunction, edema, ischemia, excitotoxicity, and restrained apoptotic cell death. During the second phase, a series of biochemical events result in energy loss, hypoxia and the consequent dysfunction of mitochondria, and the onset of apoptosis of oligodendrocytes, resulting in fibers with disrupted myelin sheath. Neurological deficits that may occur at the end of these processes become stable in 1 to 2 years.[14]

In our case, the patient did not sense the heat due to loss of sensation. Burn wound occurred due to the contact with the hot radiator all night. Although the patient received treatment for a long time, full recovery could not be achieved. A smelly discharge from the wound led us to conclude that there could be microorganisms, which could result in osteomyelitis.

Marjolin's ulcer was first described in 1828 by a French surgeon named Jean-Nicholas Marjolin as the *malignant transformation of a chronic healing processes resulting from burn injuries*.[15] In addition to the non-healing wound, the patient in our case was diagnosed with osteomyelitis and carcinoma was found in the pathology specimen.

Evaluation of the Case Using Gordon's FHP

Health Perception–Health Management Pattern

Following the spinal cord injury in 2006, the patient underwent an urgent surgery at a University Hospital in Ankara. During the postoperative period, the patient received physiotherapy in different hospitals for a long time, leading the patient to get bored from the hospital environment. The patient was uncomfortable with procedures, such as bloodletting and subcutaneous anticoagulant injection. There were instances when the patient fainted during bloodletting intervention.

Nursing Diagnosis: Ineffectiveness to Maintain Health

Etiological/related factors

Long treatment process due to the previous history of disease, the process of preparation for the current surgery.

Defining characteristics/diagnostic cues

Fear, anxiety, discomfort with a hospital stay, syncope.

Desired outcome

Adaptation to the surgical process, gaining sufficient information about the disease and the treatment process.

Interventions

- The patient was informed about the disease and flap surgery.
- The patient was informed about interventions, such as starting an IV, administering analgesics, and neurovascular evaluation of the flap. Participation of the patient was maintained.
- The patient was informed about the importance of the surgery.
- The patient was allowed to express his concerns and fears.[16]

Evaluation

The patient expressed a decrease in fears after being informed about flap surgery.

Nutritional–Metabolic Pattern

After learning that he would stay in bed for at least 5 days, the patient ate one-third of his meals and skipped some meals since he was concerned about defecating after the surgery. He expressed a loss of appetite since the day he was hospitalized (5 days). He did not meet the minimum calorie requirement for his body weight (30 cal/kg).

Nursing Diagnosis: Risk of Nutrition Less Than Body Requirement

Etiological/related factors

Loss of appetite, information deficit about the importance of nutrition

Defining characteristics/diagnostic cues

Loss of appetite, fear, meal skipping, undereating

Desired outcome

Maintaining sufficient and balanced nutrition

Interventions

- The patient was informed about the importance of nutrition and nutrients, such as proteins, carbohydrates, and lipids.

- The patient was informed that he could defecate in his bed using a bedside screen so that no one would see him.
- Daily calorie intake requirement calculated by the dietician was 2.450 kcal/day.
- Number of meals and calorie intake were recorded.
- Caregivers were asked to record the patient's daily weight and the changes in weight.
- Caregivers were asked to use the weight measurement device in the clinic to measure the patient's weight every day at the same time on an empty stomach and to inform the health personnel in case of change in weight.[16,17]

Evaluation

The patient did not skip meals and ate some or all of meals (3 main meals and 2 snacks a day). Daily weight follow-up showed no change in preoperative weight (62 kg), height (174 cm), or body mass index (20.48). These findings indicated an increase about the awareness on the importance of nutrition and adherence to daily nutrition requirements.

Daily wound dressing was performed to prevent infection in the flap site after the surgery. A smelly discharge was observed at the surgical site on postoperative day 5.

Nursing Diagnosis: Wound Site Infection
Etiological/related factors

Surgery underwent

Defining characteristics/diagnostic cues

Smelly discharge in flap site, increase in body temperature

Desired outcome

Prevention of infection at the surgical site, screening, and treatment of infection.

Interventions

- Wound dressing was changed daily.
- The patient was monitored for symptoms of infection, such as an increase in body temperature, dyspnea, and tachycardia.
- Flap site was evaluated for vascular characteristics, such as blood flow, temperature, color, and capillary refill time.
- Wound site was checked for complications, such as infection (temperature, smell, discharge), hematoma, necrosis, flap loss, and chronic pain.
- The patient and his caregivers were informed about the importance of washing their hands before and after touching the patient and the surgical site to avoid infection.[12,16,18]
- *Evaluation:* Vital findings of the patient were normal and no increase in body temperature was observed. The temperature and color of the flap site and the capillary refill time (3 seconds) were normal during the 4 days after the surgery. A smelly discharge, the only symptom of infection, was observed on postoperative day 5. *P. aeruginosa* was observed in the specimen taken from the flap site.

Elimination Pattern

Urinary incontinence for short periods (2 times a day) was observed after the removal of a Foley catheter on postoperative day 1.

Nursing Diagnosis: Change in Urinary Incontinence
Etiological/related factors

History of past illness, the use of urinary catheter after the surgery.

Defining characteristics/diagnostic cues

Urinary incontinence

Desired outcome

Controlling urinary incontinence

Interventions

- The amount of urine on postoperative day 1 was followed by an internal urinary catheter. After removing the catheter, the patient was given a urine container and was asked to urinate every 4 hours.
- A bedside screen was used to protect the patient's privacy and make him comfortable during urination.
- The patient was monitored for the development of urine retention and daily urine output. The urine was checked for color, appearance, sediments, or blood presence.
- An hourly urine output of 30 ml/h was targeted to be achieved.
- The patient was informed to continue to urinate at regular intervals
- The patient was checked 3 times a day for bladder globus.[16,19,20]

Evaluation

The average urine output on the first operative day was 50 cc/h. Urinary incontinence disappeared after the patient started to urinate at regular intervals (4 hours). No urinary retention was observed. The minimum urine output for each four hours was 250 ml.

The patient expressed that no defecation occurred 5 days after surgery

Nursing Diagnosis: Change in Constipation
Etiological/related factors

Immobility, insufficient fluid, and fiber intake

Defining characteristics/diagnostic cues

Absence of stool for 5 days

Desired outcome

Removal of constipation and maintaining normal bowel habits.

Interventions

- Bowel habits of the patient were evaluated. The patient occasionally experienced constipation during the preoperative period and stimulated his rectum for defecation.
- Auscultation of bowel sounds showed that the patient had normal bowel movements (once in 5-10 seconds).
- The patient was encouraged to sit on the toilet at the same time after the meals.
- Fluid intake was increased (2 liters on average) and the patient was informed about the importance of fluid intake.
- In consultation with the dietician, fibrous food was included in the meals of the patient to overcome constipation.
- The patient was mobilized on postoperative day 5.
- Rectal laxative was used to overcome constipation.[17,21,22]

Evaluation

Stool output occurred after laxative administration. Following these interventions, defecation was observed once in every three days.

Activity–Exercise Pattern

The patient was informed that he had to lay in the supine position for at least 5 days after the surgery and stay off operated foot for at least 45 days due to the flap surgery.

Nursing Diagnosis: Disruptions in Physical Movements
Etiological/related factors

Postoperative position to be maintained, limitation of mobility.

Defining characteristics/diagnostic cues

The patient could not stand up and could perform limited exercises on the bed.

Desired outcome

Maintaining a movement in proper position and performing the recommended exercises while protecting the flap site.

Interventions

- Positions to be taken in bed were demonstrated.
- Movement of the extremities other than the surgical site was achieved. The patient and caregivers were informed to change position every 2 hours.
- Attention was paid to keeping the bed linen clean, dry, and tense while positioning the patient.
- Pillows were used to support the hip and thigh area.
- Passive joint range of motion (ROM) exercises were performed in bed 3 times a day for at least 10 minutes in order to prevent contractures.
- The patient was mobilized by a wheelchair on postoperative day 5.
- The patient was informed that he could move with a crutch after hospital discharge but had to stay off the operated foot.[16,17,23]

Evaluation

The patient was encouraged to perform the movements in bed. Passive ROM exercises prevented contractures and the complications caused by immobility. Using a wheelchair, the patient was mobilized at least 3 times a day. The patient was relieved when he learnt that he could move with a crutch since he had already been using.

Sleep–Rest Pattern

The patient faced problems in falling asleep since he stayed in a 4-person room, could not take the proper position due to flap surgery, experienced pain at the incision site, and expressed that the environment was noisy. The duration of night sleep was about 4-5 hours and the patient woke up early due to the clinical controls early in the morning.

Nursing Diagnosis: Change in Sleep Pattern
Etiological/related factors

Inability to take the appropriate position to sleep, pain, noise.

Defining characteristics/diagnostic cues

Short duration of night sleep, waking up early in the morning, problems in falling asleep.

Desired outcome

Sufficient duration of sleep to feel well-rested

Interventions

- Analgesics recommended by the physician were administered for pain management.
- The patient was given a right lateral sleep position with the operated foot on top. Head, arms, and thigh area were supported with pillows.
- In accordance with the recommendation of the physician, 0.5 mg of Alprazolam Tb was administered to help the patient to fall asleep.
- The patient was transferred into a 2-person room and the environment was organized to help falling asleep.[12,16,24]

Evaluation

The patient slept for 6-8 hours a day and felt well-rested in the mornings.

Cognitive–Perceptual Pattern

The patient experienced severe pain at the incision site, which elevated when he performed the passive ROM exercises in bed.

Nursing Diagnosis: Acute Postoperative Pain
Etiological/related factors

Surgery underwent, increase in mobility.

Defining characteristics/diagnostic cues

Pain in the surgical site.

Desired outcome

Reduced pain in the surgical site

Interventions

- Visual Analog Scale (VAS) score of the patient was 7.
- The pain, which was occasionally throbbing and stinging, moved from the surgical site toward the calf.
- Analgesics recommended by the physician (NSA II 4 × 1, Paracetamol 4 × 1) were administered for pain management.
- The patient and caregivers were informed that they could massage the areas outside the surgical site with light touches
- Since passive ROM exercises could elevate pain, the surgical site was left to rest.[16,24]

Evaluation

The VAS score, which was 7 before the interventions, decreased to 2 after analgesic administration. The patient expressed a decrease in pain.

Self-perception–Self-concept Pattern

The patient, who already had standing and balance problems due to spinal cord injury, expressed that these problems would elevate after the surgery. The patient refrained from looking at the surgical site and asked his caregivers about the appearance of the site.

Nursing Diagnosis: Disrupted Body Image
Etiological/related factors

History of disease, the site of flap surgery.

Defining characteristics/diagnostic cues
Inability of the patient to look at the surgical site, fear.

Desired outcome

Accepting the changes in body.

Interventions

- An open and honest communication was established with the patient.
- The patient was informed about the recovery process after flap surgery.
- The patient was informed about the bodily change and the recovery processes and was supported to express his concerns.
- The patient was encouraged to look at and touch the flap site when he felt ready.[16]

Evaluation

The patient started to accept the changes in the body and believed that the situation would be better after full recovery.

Role–Relationship Pattern

Since his wife had to take care of their children, the patient's mother acted as the primary caregiver. The patient was employed in a private firm in a position for disabled individuals. He had concerns about losing job due to the medical leave and earning for family. He was also upset since he could not spend time with his family.

Nursing Diagnosis: Interruption of the Processes Related with Family and Job
Etiological/related factors

Surgery underwent, hospital stay, inability to work for a period after hospital discharge.

Defining characteristics/diagnostic cues

Inability to spend time with family, fear of job loss.

Desired outcome

Decrease in concerns about family and job loss.

Interventions

- The patient was allowed to express feelings and concerns about family and loss.
- Family members were informed about the importance of regular and frequent visits. His wife and children visited the patient once during the hospital stay.
- The patient was allowed to express his concerns about job loss and was informed about the legal rights about medical leave.[16,22]

Evaluation

Desire of the patient for recovery increased after the family visit. The patient was relieved after hearing about the legal rights related to the medical leave.

Sexuality–Reproductive Pattern

The change in body image and limitations caused by flap surgery may result in a change in sexual functions.

Nursing Diagnosis: The Risk of Sexual Dysfunction
Etiological/related factors

Change in body image, activity limitation, knowledge deficit.

Defining characteristics/diagnostic cues

Concerns about harming the surgical site.

Desired outcome

Experiences about sexual problems shared by the patient.

Interventions

- During the discharge education, the patient was informed that he could resume sexual life after full recovery.[16,24]

- *Evaluation:* The patient expressed that he was informed about sexual life during the discharge education and currently had no problems or questions.

Coping–Stress Tolerance Pattern

The patient had stress and anxiety due to previous experiences about hospitalization and the drains and pain in the surgical site. He had concerns about his job.

Nursing Diagnosis: Inability to Cope Individually
Etiological/related factors

Pain, previous experiences with the disease, processes related to job.

Defining characteristics/diagnostic cues

Stress visible in facial expressions and speech, expressions about possible job problems.

Desired outcome

Showing positive coping skills

Interventions

- The patient was encouraged to use effective coping skills.
- Active participation of the patient in the treatment and care process was maintained and the sources of support (wife, colleagues, and cousin) were determined. The patient was visited by the people, who provided support.
- Honest and clear answers were given to the patient during the recovery period.[16]

Evaluation

The patient expressed that he could cope with this negative process when he thought about family and the period after full recovery.

Value–Belief Pattern

The patient expressed that he was not afraid of death and sometimes considered it as a salvation. He was visited and phoned by relatives and friends and stated that he did not want to see anyone from time to time.

Nursing Diagnosis: Spiritual Distress
Etiological/related factors

History of irreversible disease, a new treatment process, changes in body image due to surgery.

Defining characteristics/diagnostic cues

Questioning the meaning of life and death, reluctance to receive the benefits of the support system.

Desired outcome

Reduction or elimination of spiritual distress

Interventions

- The patient was encouraged to express feelings and opinions about spiritual care.
- Concerns of the patients were listened.
- The patient was informed that he could receive psychological support.[16]

Evaluation

The patient started to pray in order to provide spiritual support. Besides, it was found that he had already received psychological support after the spinal cord injury. The patient was informed that he could receive support again.

Discussion

The patient in our case report was a 22-year-old male with spinal cord injury. Existing studies reported that traumatic spinal cord injury mostly affected males aged 18-32 years in developing countries, and males and females over the age of 65 years in developed countries.[25]

Urinary incontinence, constipation, and musculoskeletal and neurological disorders involving sensory loss were found in our case. Disruption in neurological transmission caused by spinal cord injuries causes motor, sensory, and automatic disorders. A comprehensive cross-sectional study proposed a model to determine the secondary health conditions in patients with spinal cord injury for at least 10 years and to develop guidelines to improve healthcare services provided to these patients. The primary aim of the study was to describe the prevalence of secondary health conditions, such as urinary tract and bowel problems, pressure ulcers, musculoskeletal and neuropathic pain, sexual dysfunction, respiratory and cardiovascular disorders, in patients with long-term spinal cord injury.[26]

The patient in our case had urinary incontinence caused by preoperative spinal cord injury. Bladder and lower urinary tract dysfunction, the presence of comorbidity conditions, decreased pain sensation, or other potential sources of infections are common problems that complicate the diagnosis and follow-up procedures in most of the neurological patients, including the patients with spinal cord injury.[20] Supporting the patient for frequent urination with interventions, such as intermittent catheter and disposable underpad, is highly important. Besides, since these situations may cause the patient to be embarrassed, privacy of the patient should be protected. Nursing interventions in our study reduced the elimination problems.

Medical problems associated with neurological bowel include problems, such as fecal incontinence, constipation, abdominal pain, difficulty or prolonged time with bowel evacuation, autonomic dysreflexia, hemorrhoids, rectal bleeding, and bowel obstruction. The term neurological bowel refers to colon dysfunction caused by the lack of neurological control.[27] Postoperative constipation in our case was caused by not only the lack of neurological control but also reclining position and inactivity. A case report of a patient with deep vein thrombosis, which also used Gordon's FHP model, reported constipation problem that was relieved with similar nursing interventions.[22] Fecal incontinence or constipation are common problems in patients with spinal cord injury. Dietary management is recommended as an early treatment strategy to cope with such problems.[28]

In our case, the foot of the patient was contacted by a considerably hot radiator, which resulted in loss of sensation and burn wound. As this wound became chronic, the treatment process was initiated. Patients with spinal cord injury may not feel hot or cold or a light touch sensation below the level of injury.[29]

During the interviews, the patient expressed spiritual distress and reluctance to speak with anyone. Studies in the literature reported that traumatic events, such as spinal cord injuries, had negative impacts on mental health,[30] and found a relationship between negative emotions and the functional losses of the patients with spinal cord injury, including mobility problems, loss of control over bladder and bowel functions, and lack of sexual derive. Problems, such as psychological trauma and elevated stress, are common among the people, who feel inadequate.[31]

Although the patient in our study could not see his family during the hospital stay, we encouraged the family members to visit the patient and participate in healthcare. Family support in our study increased the resilience of patients. Existing studies also reported that family members had a central role in caregiving. [31-32]

Conclusion

Models to determine the problems of patients and plan their care help the health professionals to systematize and standardize patient care. This case report showed that Gordon's FHP model can be used to provide a comprehensive nursing care based on patient needs. The use of such models in clinical environments, where the problems with data collection may occur due to workload, may help health professionals to identify the problems of patients and to provide individualized care. As in our case, these models may also guide health professionals to solve new problems added on chronic diseases, which in turn, may increase the quality of care. Further studies on complicated patient groups may increase awareness on the importance of using Gordon's FHP model.

Informed Consent: Written and verbal consent was obtained from the patient who participated in the study.

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