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MULTIPLE DECUBITUS ULCERS IN TYPE II DIABETIC PATIENTS WITH AUTOLOGOUS PLASMA-RICH PLATELET THERAPY

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ABSTRACT

Background: Multiple decubitus ulcers are a condition of injury that appears on several parts of the body's skin due to pressure for a long time without any change in position. This condition usually occurs in someone with limited movement, for example, due to experiencing certain disease conditions that require the person to rest in bed for a long time, especially patients in the Intensive Care Unit (ICU) or after ICU care with chronic diseases and limited movement. **Case Presentation:** This case report assesses the success of multiple cases of decubitus ulcers in patients with type II diabetes mellitus with Autologous Plasma Rich Platelet therapy. Case report: Autologous PRP therapy is given by intralesional injection; debridement is done every three days and assessed every one week. Patients are also subjected to blood sugar control, blood pressure control, blood correction, and albumin to speed up the wound healing process in multiple decubitus ulcers. **Conclusion:** the conclusion of this case report with additional management in the form of intralesional injection of autologous PRP performed on multiple decubitus ulcer patients with Diabetes Mellitus, which is rich in growth hormone, will greatly help the wound healing process.

INTRODUCTION

Decubitus ulcer is a condition that appears on the body's skin due to pressure for a long time without any change in position. This wound is often found on protruding body parts such as heels, elbows, hips, and coccyx. This suppression will cause blood flow to the tissues in that part of the body to be disrupted so that the tissue gradually dies and forms wounds. This condition usually occurs in someone with limited movement, for example, due to experiencing certain disease conditions that require the person to rest in bed for a long time, especially patients in the Intensive Care Unit (ICU) or after ICU care with chronic diseases and limited movement.

Decubitus ulcers are often found in people with Diabetes Mellitus. Diabetes Mellitus patients with uncontrolled blood sugar levels will have a higher risk of decubitus ulcers because high blood sugar levels are food for germs to multiply and cause the infection to worsen. Chronic complications of decubitus ulcer patients with Diabetes Mellitus can occur at the microvascular level (diabetic retinopathy, diabetic nephropathy, diabetic neuropathy, and cardiomyopathy) and macrovascular (stroke, coronary heart disease, peripheral vascular disease).[4,5]. Other complications of Diabetes Mellitus can include excessive susceptibility to infection due to uncomplicated urinary tract infections, pulmonary tuberculosis, and foot infections, which can then develop into diabetic ulcers/gangrene.[4,5]

At first, wounds that experience compression for a long time will cause tissue to become ischemic; if the tissue worsens, it becomes necrotic, so the incidence of decubitus ulcers is more common. In ischemic

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conditions, blood flow that is not smooth in the area with emphasis causes less oxygenation to the affected place, so antibiotics are difficult to distribute to the area, causing bacteria to multiply very quickly and making the wound more difficult to heal.[3] In addition, some other conditions that can increase the risk of ulcers are patients with poor nutrition (often we find with laboratory results of hypoalbumin), heart failure, kidney failure, spinal cord injury, obesity, and lying patients with limited mobility.

This injury can be avoided by changing the body's position periodically so that the emphasis on the skin in the body's organs can be minimized. If there have been multiple decubitus ulcers in patients with Diabetes Mellitus, treatment should be done as soon as possible. Handling that must be done includes control of metabolic factors, infections, and vascular. Control of metabolic factors such as blood glucose levels, lipids, albumin, hemoglobin, and so on. Control of infectious factors, when clinical signs of infection, should be given aggressive treatment of infection. If there is pus, a resistance culture test can be carried out, then antibiotics are given according to the test.

Further, regular removal of infected tissue and necrosis is carried out. While vascular control is carried out in the form of improving vascular flow and controlling the occurrence of suppression. In patients with multiple decubitus ulcers with diabetes mellitus that are not treated immediately, there will be widespread wounds in a short time.

This case report presents Multiple Decubitus Ulcers stage 4 in patients with Diabetes Mellitus who are injected with intralesional autologous Plasma Rich Platelets (PRP) during wound care, which is used as additional therapy.

CASE REPORT

A 72-year-old man was treated at home with ICU-like quality. The patient was supposed to be hospitalized in the ICU, but due to cost constraints and during treatment, there was no progress for the last one week (the patient had received ICU care for two weeks), so the family decided to do home care. When returning home, the patient was in general condition seriously ill, somnolene apathy consciousness, body weight 80 kg, height 180 cm, blood pressure 170/105 mmHg, pulse rate 90x/min, breathing rate 24x/minute, gasping with ventilator mode Synchronized Intermittent Mandatory Ventilation (SIMV), saturation 97%, patients with history of correction of albumin, Packed Red Cell (PRC) and blood sugar. Patients, while in the hospital, are carried out routine complete blood tests, albumin every three days and fasting blood sugar checks every morning. In patients, there are multiple decubitus ulcers in the area of the sacrum, right and left calf, heel, and instep of the left foot. The patient also had multiple comorbidities of type 2 diabetes mellitus (which was controlled with antidiabetic injection of insulin aspart as insulin short acting, Novorapid (Novo Nordisk) with administration of 1x18U (8-0-0-0) and oral antidiabetic Trajenta 5mg (1x1tab) Linagliptin group (Boehringer Ingelheim), hypertension with Canderin 8mg (1x1tab) group Angiotensin Receptor Blocker (Dexa Medica), anemia and hypoalbumin.

The patient had previously been bedridden at home for about ten months and could not mobilize due to weakness due to uncontrolled diabetes mellitus. There is a decubitus wound on the sacrum measuring 1x1 cm with 1st degree. Decubitus prevention protocols such as the use of decubitus mattresses, patient repositioning, and wound care are carried out, but wounds are increasingly widespread.

In the last three weeks sepsis from pneumonia has occurred, and the decubitus wounds have worsened. The family decided to be taken to the hospital and admitted to the ICU for approximately three weeks until finally, the patient was brought back home.

When treated at home, based on patient complaints and physical examinations that have been carried out, the work diagnosis that is established is sepsis, etcausa pneumonia, and multiple decubitus ulcers with type 2 diabetes mellitus, hypertension, and hypoalbumin.

Figure 1. Multiple Decubitus Ulcers at the beginning of the patient's return home, including A. Sacrum, B. Left Foot, C. Left Heel, D. Right Leg

Patients are given general and special management. General management is by educating the patient's family about the management of sepsis, blood sugar control, and tension and complications that can occur, and giving a diet with high protein according to

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the direction of a nutritionist while in the hospital. Special management in the form of weaning breathing from the ventilator and for multiple decubitus ulcers will be planned wound care (in order to maintain the hygiene of decubitus wounds by cleaning the tissue damage every 3 days. When necessary, dead tissue is removed) and intralesional PRP autologous injection after debridement. The patient's family is also explained the PRP autologous process; after the family understands and agrees, they sign an informed consent for the implementation of PRP autologous.

In multiple wounds, decubitus ulcers are cleaned with 0.9% NaCl, and if there is necrotic or dead tissue, it will be removed. They were then rinsing with prontosan irrigation liquid (Production of B.Braun: 0.1% polyhexanine and 0.1% undecylenamidopropyl betaine). Then an intralesional injection of Autologous PRP (Figure 2) is performed, and the clean wound is closed with cutimed sorbact gel or calcium alginate dressing, coated with a foam dressing, and covered with sterile gauze and transparent plaster. Debridement therapy and PRP autologous injection are performed every three days until the 15th treatment. To assess the development of wounds, evaluations are carried out every one week: day 8, day 15, and day 22.

Autologous PRP was performed on patients using 54 mL of venous blood and dividing it into 12 tubes containing sodium citrate and centrifuged at 1000 rpm for 10 minutes. A separate plasma will be obtained; this plasma is centrifuged again at a speed of 3000 rpm for 10 minutes. After that, protein-rich plasma is injected into multiple lesions of decubitus ulcers.

Figure 2. Intralesional Injection of Multiple Decubitus Ulcers

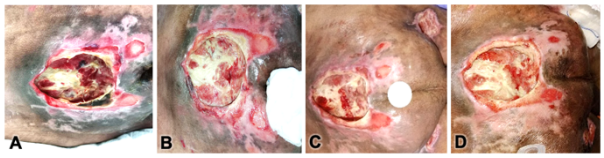

Figure 3. Development of Decubitus Ulcer in the sacrum performed by Autologous PRP. A. Pre-therapy day 1, B. Day 8, C. Day 15, D. Day 22.

Figure 4. Development of Decubitus Ulcer on the left leg performed by Autologous PRP. A. Pre-therapy day 1, B. Day 8, C. Day 15, D. Day 22.

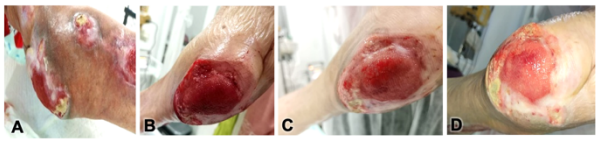

Figure 5. Development of Decubitus Ulcer on the heel of the left foot performed by Autologous PRP. A. Pre-therapy day 1, B. Day 8, C. Day 15, D. Day 22.

Figure 6. Development of Decubitus Ulcer on right leg performed by Autologous PRP. A. Pre-therapy day 1, B. Day 8, C. Day 15, D. Day 22.

Seeing the development of wounds on day 15 is getting better; that is, there is a proliferation of cells in each part of the ulcer. The wound becomes shallower and shrinks in size. So then PRP autologous injection is done once every one week even though debridement is still done every three days. Further autologous evaluation of PRP is still carried out every one week.

The prognosis in these patients is dubia for quo ad vitam, quo ad functionam, and quo ad sanationam.

DISCUSSION

The incidence of decubitus ulcers in Indonesia reaches 33.3%; this figure is relatively high when compared to the prevalence rate of decubitus ulcers in ASEAN, which only ranges from 2.1 – 31.3% (Yolanda, 2013).[7]

This patient's decubitus ulcer is caused by several factors, namely immobilization, frictional force, and skin moisture, over a long period. Immobilization and frictional forces result in pressure on the skin, especially in bone protrusion. This pressure causes

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ischemia and hypoxemia in the affected tissue, given that blood flow to the site is reduced. While moisture increases skin maceration (softening due to wet) and causes the epidermis to erode more easily and inhibit blood flow. Suppression also causes obstruction of blood flow, which will block oxygenation and nutrients to the tissue, contributing to skin tissue necrosis. Patients experience necrosis in skin tissue that is not treated immediately, so that the wound extends slowly until damage occurs in muscle and bone tissue. If necrosis has occurred in the muscles and bones, it can also be gradual in the tendons and joints.[8]

The characteristics of wounds that appear in patients with decubitus ulcers are divided into:

- Grade 1 decubitus ulcers are characterized by discoloration of some regions of the skin, for example, becoming reddish or bluish, accompanied by pain or itching in those areas.
- Grade 2 decubitus ulcers are characterized by abrasions or open sores in the affected area.
- Grade 3 decubitus ulcers open wounds that occur to several deeper layers of skin (skin ulcers).
- Grade 4 decubitus ulcers are characterized by open wounds that are so deep that they reach the muscles and bones.

In patients found with decubitus wounds in several places, wounds are open wounds that have been seen bone and damage to tendons, so this patient is diagnosed with multiple decubitus ulcers with stage 4.

At the time of home treatment ten months ago, the patient knew he had high blood pressure and diabetes mellitus. The patient refuses to take antidiabetic and antihypertensive drugs; the patient takes only herbal medicines. At first, the wound found on the patient measured 1cm x 1 cm; the patient was cared for by his wife and a female maid. The patient's body is tall and large, so it is difficult for wives and maids to change the patient's body position. The occurrence of widespread injury to patients due to pressure on the skin in the long term due to difficult mobilization, uncontrolled blood sugar, provision of a diet without high protein, and management of non-aggressive wounds. During home treatment, the patient has used a decubitus mattress that aims to reduce pressure on the body's skin, but the expansion of ulcers in some places still occurs.

The body position of patients with multiple decubitus ulcers must be changed periodically. If you use a wheelchair, move your weight support to the other side every 15 minutes or change positions every hour. If the patient is in bed, change the position to tilted left, tilted right, and back on his back every 2 hours if the patient has used an anti-decubitus mattress, to reduce pressure on certain areas of the skin and maintain good airflow to those areas. Changes in the patient's position still need to be changed periodically. Management that should be done in patients with multiple decubitus ulcers should be multifactorial, including :

1. Dick metabolic factors, the best possible control such as control of blood glucose levels, albumin correction, and hemoglobin correction.
2. Control of vascular factors improvement of circulatory flow, especially in patients who have had ischemic ulcers, angioplasty can be done in the hospital.
3. Control of infection, if clinical signs of infection should be given, aggressive treatment of infection (colonization of the organism's growth on the results of culture tests).
4. Wound control, removal of infected tissue and necrosis routinely with the TIME concept, namely Tissue debridement, inflammation and infection control, Moisture balance, and Epithelial edge advancement.
5. Control pressure reduce pressure on the area where ulcers can occur.
6. Counseling by educating families about wound care to patients every three days and conducting autologous PRP injections in all areas of decubitus.

Autologous PRP is a part or component of our blood that has the advantage of containing substances that function to stimulate the growth of damaged body parts because they include growth factors, which can control systemic and local inflammation through various proteins such as interleukin-1 receptor antagonists, vascular endothelial growth factors, platelet-derived growth factors, and epidermal growth factors.3,4 Thus, The administration of aaPRP also provides much-needed growth factors in the lesions.

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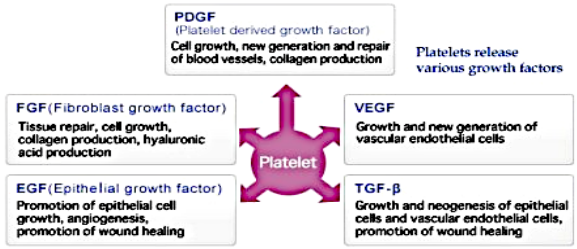

Figure 7. Mechanism PRP[9]

Several complications can arise if multiple decubitus ulcers are not treated immediately, namely: Cellulitis, resulting from infection of the skin and soft tissues; Bone and joint infections, resulting from the spread of infection from the skin and soft tissues; Sepsis, which is an infection that spreads to the bloodstream and causes an immune system reaction throughout the body that can be fatal Cancer, due to wounds that never heal (Marjolin ulcer). In patients, complications have occurred in the form of severe sepsis, so that the patient was hospitalized in the ICU for three weeks, and when he returned home, he was still in a state of sepsis with improvement.

CONCLUSION

Multiple decubitus ulcers are caused by pressure and friction on the skin that can block blood flow to the skin and damage the skin's surface in some places. In addition, several factors can also increase a person's risk of developing decubitus ulcers, including limited movement, impaired blood flow, especially in Diabetes Mellitus, whose blood sugar is not controlled, and nutrient and fluid intake that is not according to their needs.

Management of multiple decubitus ulcers in Diabetes Mellitus must be carried out immediately, and multifactor control, including metabolic control, vascular control, infection control, wound control, pressure control, and counseling to patients and their families.

Additional management in given intralesional autologous PRP injections performed on these patients, in addition to general management of multiple decubitus ulcers, greatly helps the wound healing process.

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