
Surgical Treatment of Decubital Ulceration - Our Clinical Experience

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Abstract: Introduction: Decubital ulceration is a tissue defect resulting from the soft tissue necrosis at the point of their compression between bone prominence and the surface of the body support over an extended period of time. Decubitus occurs most often in hospitals (about 60%), nursing homes and other long-term care facilities are second, while 9% to 20% of decubitus occurs in home care patients. Patients and methods: In the period 2000-2009, 36 patients with 44 decubital ulceration were treated at the Department of general surgery of General Hospital in Bijeljina. Surgical treatment of decubital ulceration is associated with the degree of damage to deep bone structures (sacral bone, sciatic bone, femur). More than one operation was performed in six patients. Results: Nearly 90% of our patients had lower-body decubitus. Surgical treatment of decubital wounds consists of: radical trimming of devitalized tissues, bursa and removal of heterotopic calcification, partial or complete osteotomy of bone prominences, and closure of the defect with well-vascularized, soft, local, skin, or muscular lobes. In addition to surgical treatment, conservative treatment measures have been implemented in patients; redistribution of pressure in critical areas, daily body hygiene, regular changing of bedding, wound disinfection with antiseptic, application of various dressings and topical medicines, electromagnetic therapy, ultrasound therapy, Vac therapy. The most common complications were infections, partial hepatic necrosis, and dehiscence. Conclusion: The surgical treatment of decubital ulceration requires good preoperative care, a clear preoperative plan and teamwork. Postoperative care is of great importance and must include trained medical staff as well as a professional team for physical rehabilitation.

Keywords: Decubital Ulceration, Surgical Treatment, Therapy

1. Introduction

Decubitus (lat. Decumbere = lie) is a disease that occurs by pressing on a particular part of the body by lying down or sitting, or more precisely, by applying a strong and prolonged pressure to a certain part of the tissue on the body, thereby interrupting the circulation of blood and oxygen in that part of the body and the skin thereon. The part turns solid and red or soft and purple in color. As blood flow is interrupted in that particular part of the body, blood flow through some organs is also reduced due to constriction or obstruction of the blood vessel (ischemia), and where the blood does not circulate, bacteria accumulate because such an area without the necessary blood circulation is always a convenient breeding ground for bacteria. The most common bacteria that develop in this area are *Pseudomonas*, *Staphylococcus aureus*

and *Proteus* [1, 2].

The formation of decubitus is dominated by three main mechanisms;

1. Pressure is the most important factor in the development of decubitus, especially when it occurs above the bones parts. External pressure on the tissues causes compression and distortion of the smallest blood vessels. If the pressure is higher than the capillary pressure, a blood vessel occlusion will result. The capillaries close if the pressure rises above 32 mmHg.
2. Shear occurs when a patient slides down in a bed or chair. Shear forces cause the small blood vessels to refract, stretch or tear, resulting in interruption of blood flow and ischemia. If ischemia is prolonged, it causes endothelial damage, thrombosis occurs, and cell death.
3. Friction is described as a force created when two

surfaces slide over one another, in this case the skin against a sheet, a bed, a wheelchair, etc. This mechanism causes superficial injury such as epidermis scab [3-5].

Any of these mechanisms leads to occlusion (blockage) of microcirculation causing ischemia (insufficient blood flow to the tissues), inflammation and hypoxia of the tissue (lack of oxygen to the tissues), resulting in cell death, necrosis and chronic wounds (ulceration).

2. Patients and Methods

In the period from 01 January 2000 to 01 January 2019. 136 patients with 144 decubital ulceration were treated at the Surgical department of Public health institution hospital "Sveti Vracevi" in Bijeljina. Surgical treatment of decubital ulceration is associated with the degree of damage to deep bone structures (sacral bone, sciatic bone, femur). More than one operation was performed in six patients.

3. Results

In our study, 90% of patients had decubitus in the sacrococcygeal region and lower extremities (Figure 1).

The most common complications were infections, partial hepatic necrosis, and dehiscence.

Twenty-three patients had diabetes, four were chronic alcoholics.



Figure 1. Decubitus in the sacrococcygeal region

The diagnosis of the disease is most commonly made on the basis of clinical examinations, analyzes and the use of microbiological examination materials (Figure 2).



Figure 2. The diagnosis of decubitus on the clinical examinations

The wound swab, obtained by curettage of necrotic tissue, isolated the following: *Pseudomonas aeruginosa* 11, *Acinetobacter* 9, *Escherichia coli* 15, *Staphylococcus aureus* 16, *Proteus* 11 and *Bacteroides* 15. These were intrahospital strains resistant to most antibiotics. According to the antibiogram, Amoxicillin + Impenem and later Meropenem were administered. The average duration of treatment is 73 days.

The main concept of patient treatment went in three directions:

First - HEMODYNAMIC STABILIZATION, all measures of intensive care and resuscitation must be taken, especially in patients with signs of systemic intoxication or septic shock.

Second - PARENTERAL APPLICATION OF ANTIBIOTICS, intensive administration of antibiotics (triple therapy) must be undertaken after taking the material for microbiological examination. We administered all patients with Longaceph amp. a 2g/12h. Crystal Penicillin a 4 000 000 i. j./4 hours and Metronidasol amp. a 500 mg / 8h.

Third - SURGICAL DEBRIDMAN, all measures are taken for generous incision, debridement and aggressive excision. It is very difficult to judge the limits of tissue debridement, especially in extensive infections. After extensive surgical procedures, local treatment of the new wound is undertaken (Figure 3). We made sure we rinsed the wounds with 3% Hydrogen peroxide, 0.9% NaCl, Povidone - Iodine. All patients were in analgo sedation to prevent flushing, incision and debridement pain. Such procedures are repeated several times during the day, and extensively after 24 hours. Due to the pronounced exudation and to curb the infection, ulcers with high absorbent charcoal and ionisable silver (Actisorb silver) were added to the ulcer. Autolytic debridement is stimulated by having the wound daily extensively coated with calcium alginate with ionized silver (Aquacel) over which a hydrocolloid is applied. To protect the wound from secondary contamination with faecal bacteria, a polyurethane film was applied over the wound



Figure 3. After extensive surgical procedures, local treatment of the new wound is undertaken

1. OSTEOTOMIES (removal of inflammatory parts of the bone)
2. CLOSING OF LOCAL SKIN DEFECT

Decubitus treatment can also be conservative;

Conservative treatment - includes the following measures and procedures;

1. Frequent redistribution of pressure in critical areas by padding, application of bandages at endangered areas, use of special antidecubital beds and change of patient position every two hours.
2. daily body hygiene, regular changing of linen and taking care of folds on linen and personal laundry.
3. Regular and proper nutrition, with the intake of a sufficient amount of protein, vitamins (especially vitamins A and C), elements involved in the transport of oxygen (zinc, iron, copper).
4. Constant control of the infection, regular disinfection of the wound with antiseptic, as well as general measures (regular use of medicines and antibiotics according to the antibiogram).

Application of various dressings and topical medicines, electromagnetic therapy, ultrasound therapy, Vac therapy (negative pressure treatment), etc.



Figure 4. *The treatment of decubitus is a very complex, reconstructive surgery is very significant*

The treatment of decubitus is a very complex and long process that requires a multidisciplinary approach and the involvement of doctors of different specialties: dermatology, surgeons, internists (cardiologists, endocrinologists), urologists, neurologists, physiatrists, mid-medical staff and supportive medical staff (Figure 4).

The nurse plays a particularly important role in the treatment of patients with decubitus, who provides the patient with all the necessary care, and at the same time implements all prevention measures. That is why decubitus treatment is one of the most expensive treatments in medicine, and is one of the long-lasting ones.

4. Discussion

Beginning with the onset of the human species, decubitus is present in most patients with reduced mobility. Traces of decubitus have been observed on Egyptian mummies and first described in medical literature in the 19th century [6].

Persons incapable of preventing the continuous pressure of the solid surface on the tissues are constantly at increased risk of decubitus. This occurs in patients of advanced age, in persons with neurological problems, and in those admitted to hospital for acute illness. Such persons cannot protect themselves from the onset of decubitus either because they cannot change their body position themselves or because they

irregularly and deliberately receive the help they need to perform certain movements or change their body position.

Decubitus is most prevalent in hospitals (about 60%), followed by the frequency of social care institutions (gerontology centers). At home, decubitus occurs less frequently; probably because of better care and care of the household (about 9-20%) [7, 8].

Many factors influence the appearance of decubitus, but the pressure that leads to ischemia is the underlying mechanism. Tissues are able to withstand high pressure if it lasts for a short time, but prolonged pressure just above the capillary starts the processes leading to ulceration.

The most important causes are:

Reduced mobility as a very important factor. Neurological patients, sedated or demented patients are unable to self-alter body position and reduce pressure themselves. In these patients, muscle paralysis leads to a decrease in their mass, which results in the loss of a protective layer between the bones and the skin. Contractures and spasticity often contribute to the development of decubitus, due to the constant exposure of the same parts of the body to pressure. Loss of sensation contributes to the appearance of decubitus because it excludes one of the most important warning signals: pain. Malnutrition, hypoproteinemia and anemia increase the vulnerability of the skin and prolong the healing time of wounds [9, 10].

Bacterial pollution due to inadequate skin care (including incontinence) and the decline of defense (immune) mechanisms indirectly contribute to the development and difficult healing of decubitus [11].

The clinical picture of decubitus is dominated by the localization of changes in regions of the body that are exposed to pressure on hard, wet, and / or uneven substrates, ie. on the protruding parts of the body, which are formed by the lumbar spine, saddle bone, hip joint, ankle, knees or elbows, as well as in areas where the fat is less developed

In the emergence and development of the clinical picture, we distinguish between the stages of decubitus;

Stage I - The appearance of redness with edema. This condition usually occurs after two to three hours of pressure in the same place. The patient feels pain, itching or heat in the pressure area. It has no wound, and the redness does not disappear when pressed. The skin temperature is different from the surrounding skin. At this stage, the changes are still reversible.

Stage II - Bubbles occur on the affected part of the skin and partly on the subcutaneous tissue. There is also a cell alteration into the epidermis (outer layer of skin). The skin is purple in color. The damage is not yet final.

Stage III - The appearance of brown skin color and tissue necrosis in the affected area with visible muscle; this stage is followed by the mandatory occurrence of infections. The skin becomes more black and becomes very dry. Clinically, this stage is characterized by the appearance of a crater, with or without surrounding tissue, and significant tissue damage that is irreversible. muscles and visible parts of the bone; and this stage is characterized by obligatory infection, the appearance

of sinus cavities, and irreversible changes.

V Stage - Stage of ulcer multiplication (ulceration), in different stages of development.

About 75% of stage II decubitus can be cured within eight weeks, only 62% in stage IV decubitus can ever be cured, and only 52% have a cure within one year [12, 13].

The clinical picture of decubitus is the most common in patients with spinal injury but is also found in comatose patients, malnutrition, diabetics, neurological, psychiatric and oncological patients. Among surgically treated patients at the Military Medical Academy in Belgrade (forty-year study), patients with stage III and IV decubital ulcers, close to 95% had decubitus in the lower body, 75% in the pelvic region, and 20% in the lower extremities [14, 15].

5. Conclusions

Decubital ulcers are chronic wounds with long-term healing. It is particularly important to provide additional therapies to improve the patient's general condition and nutritional status with local phase-specific support, which includes thorough debridement, continuous wound cleaning, conditioning of granulation tissue formation and assisting epithelialization. Wet treatment in which hydroactive blankets help cleanse and condition the wound and stimulate epithelialization is considered a standard therapeutic approach for the treatment of decubital ulcers. Places to look out for when sitting and lying down are the protruding parts of the body, such as the sitting bones or tuber, hips and heels.

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