DOI https://doi.org/10.30525/978-9934-26-226-5-27

ULTRASOUND STUDY OF INFLAMMATORY DEFECTS OF SOFT TISSUES AND ITS USE IN FURTHER IMPLEMENTATION OF RECONSTRUCTIVE-PLASTIC INTERVENTIONS

УЛЬТРАЗВУКОВЕ ДОСЛІДЖЕННЯ ЗАПАЛЬНИХ ДЕФЕКТІВ М'ЯКИХ ТКАНИН ТА ЙОГО ВИКОРИСТАННЯ ПРИ ПОДАЛЬШОМУ ВИКОНАННІ РЕКОНСТРУКТИВНО-ПЛАСТИЧНИХ ВТРУЧАНЬ

Lurin I. A.
Academician of the National Academy of Medical Sciences of Ukraine, Vice President of the National Academy of Medical Sciences of Ukraine, Professor
Ukrainian Military Medical Academy, Kyiv, Ukraine

Лурін І. А.
академік Національної академії медичних наук України, віце-президент Національної академії медичних наук України, професор
Національний військово-медичний клінічний центр Головний військовий клінічний госпіталь Міністерства оборони України м. Київ, Україна

Khomenko I. P.
Doctor of Medical Sciences, Corresponding Member of the National Academy of Medical Sciences of Ukraine, Professor
Ukrainian Military Medical Academy Kyiv, Ukraine

Хоменко І. П.
доктор медичних наук, член-кореспондент Національної академії медичних наук України, професор
Національний військово-медичний клінічний центр Головний військовий клінічний госпіталь Міністерства оборони України м. Київ, Україна

Tertyshnyi S. V.
Candidate of Medical Sciences, Head of the Department of Surgical Infection, Military Medical Clinical Center of the Southern Odesa, Ukraine

Тертишний С. В.
кандидат медичних наук, завідувач відділення хірургічної інфекції Військово-медичний клінічний центр Південного регіону Міністерства оборони України м. Одеса, Україна

The purpose of the work is to study the issue of investigation of gunshot defects of soft tissues and their use in the further implementation of reconstructive and plastic interventions.

The object of the work is fire defects of soft tissues.

The subject of the work is an ultrasound examination of gunshot defects of soft tissues.

Doppler ultrasound is a non-invasive method that is widely used in clinical medicine to obtain information about blood circulation. It can be used to determine the patency of blood vessels, as well as the direction and speed of blood flow. This technique allows you to clearly distinguish veins from arteries and to determine various vascular pathologies regardless of the diameter of the vessel. It allows you to accurately determine the presence of stenosis or occlusion and distinguish an aneurysm from a pseudoaneurysm. With the help of this method, hemodynamics can be studied not only in large vessels but also in small vessels with a diameter of less than 2 mm, for example, when assessing the leg of a free flap during reconstructive and plastic surgery.

Doppler principle, it is possible to estimate the speed of a moving object by recording the ultrasonic waves reflected by it. Pulsed Doppler can simultaneously acquire 2D (B-mode) and M-mode images and know where a single target point is in relation to the sensor.

Thus, it is possible to measure the maximum, average, and minimum speed of blood flow in vessels. Color flow imaging is derived from pulsed doppler, in which color is introduced to better determine the flow direction. The peak velocity is the maximum velocity of red blood cells to the ultrasound sensor in systole, and the minimum velocity corresponds to the lowest velocity in diastole.

Muscles and intestines are called teachings of "variable resistance" because their blood supply and resistance to blood flow depending on their activity. A change in impedance from high to low physiologically occurs in the limbs after exercise or in the vessels of the intestine after eating, which leads to increased blood flow. Vasodilatation reduces vascular resistance, therefore blood flow increases. These hemodynamic states are manifested by two different Doppler patterns. In "low-impedance" tissues, blood flow is biphasic, with maximum velocity in systole and erythrocyte velocity (lowest velocity) in lower diastole, and at the same time is constantly positive (above the zero line), indicating antegrade scrolling of blood.

Color-coded duplex ultrasound (CCDS) is useful for reproducing the anatomy of the perforating vessel of a potentially free musculocutaneous flap, and this technique demonstrates high sensitivity and specificity for identifying microvessels.

Despite the high success rates of reconstructive plastic surgery with free flaps (95-99%), the problem of nonfunctioning or thrombosed anastomoses still exists, and although free microvascular flaps are routinely used in reconstructive surgery, our knowledge of perioperative changes in blood flow to release m' of ulcerated skin flaps remains limited. In addition, the influence of the free flap on blood flow parameters in the recipient's vessel has not been sufficiently studied. Until recently, there were few methods of intraoperative research on blood flow in free skin-muscle flaps. But with the advent of ultrasound doppler, the situation changed dramatically.

It should also be taken into account that after transplantation, adipose tissue, as a rule, has less blood flow than muscle tissue. The hemodynamic picture was similar in flaps containing a large number of muscles (muscular, cutaneous-muscular-muscular): after the formation of an anastomosis, the intraoperative blood flow increased, most likely due to a decrease in vascular resistance associated with muscles.

When free flaps are used in conjunction with vascular bypass grafting in the same lower extremity, it is particularly important to consider our findings that microvascular transfer can regulate blood flow in the recipient artery, resulting in a redistribution of blood flow.

The average intraoperative value of blood flow in the venous shunt of the operated area after transplantation of a free flap increases by approximately 50%, since the transplantation of denervated muscles, reduces the vascular resistance of the flap.

Color Doppler ultrasound has recently been used to study free flaps and is essentially a non-invasive method of monitoring blood flow in flaps before, during, and after surgery. Salmi and colleagues retrospectively used color, Doppler. They showed that free muscle flaps operated for 3–5 years retain the capacity of the anastomotic zone longer if they include a large number of muscles, and the long-term preservation of the flap is due to stable and increased blood flow in the pedicle. . An increase in blood flow in free muscle flaps has also been shown 2 weeks to 3 months after surgery, mainly due to an increase in diastolic blood flow and decrease in vascular resistance.

The main reason for the increase in blood flow was probably a decrease in vascular resistance at the level of the arterioles of the free muscle flap. Sympathectomy due to muscle denervation can significantly increase blood flow, contributing to the narrowing of arterioles. Muscle tone is also lost due to denervation, which promotes vasodilation. These postoperative color Doppler studies confirmed the intraoperative hemodynamic changes in free muscle flaps, which may explain the beneficial effect of these flaps on wound healing and chronic infections. Another finding of this study was

that Ri decreased at the recipient site. The fact that the blood flow velocity in the control arteries was comparable suggests that the measurements were valid and reliable.

In all cases, after transplantation, adipose tissue, as a rule, has less blood flow than muscle tissue. The hemodynamic picture was similar in flaps containing a large number of muscles (muscular, cutaneous-muscular-muscular): after the formation of an anastomosis, the intraoperative blood flow increased, most likely due to a decrease in vascular resistance associated with muscles.

In 5 cases, the features of the damage to the soft tissues of the trunk and the clinical picture required the use of free flaps in combination with vascular shunting on the same lower limb, while it is especially important to consider that the microvascular transition can regulate blood flow to the recipient artery, which leads to redistribution of blood flow.

The average intraoperative value of blood flow in the venous shunt of the operated area after transplantation of a free flap increases by approximately 50%, since the transplantation of denervated muscles, reduces the vascular resistance of the flap.

Therefore, the tactics of individual surgical treatment of gunshot injuries of soft tissues with the various technical support of the intra- and postoperative periods in accordance with the multimodal approach to the reconstruction of gunshot injuries of soft tissues were proposed and implemented, which made it possible to improve the definition of treatment tasks and the evacuation of wounded with combat surgical trauma.

Preoperative assessment of perforating vessels with CCDS sometimes takes longer, which can be a challenge in the department. However, the time spent on the CCDS-guided microvessel paid off for the authors with improved flap design before the first cut.

Due to the preoperative mapping of perforating vessels, CCDS is comparable in terms of time and cost-effectiveness to conventional ultrasound Doppler.

Preoperative assessment of perforating vessels using CCDS may contribute to earlier patient recovery and rehabilitation, as well as a better overall outcome.

References:

1. Геращенко С.Б., Дельцова О.І., Коломійцев А.К., Чайковський Ю.Б. Периферичний нерв (васкулярно-десмальні зв’язки в нормі і при патології). Тернопіль: Укрмедкнига; 2005. 342 с.

2. Поетапне хірургічне лікування постраждалих з вогнепальними пораненнями кінцівок О.А. Бур'янов, А.М. Лакша, Ю.О. Ярмолюк, А.А. Аннали травматології та ортопедії. 2015;1-2:50-52.

3. Курінний І.М., Страфун С.С., Гайович В.В. Мікрохірургічна трансплантація васкуляризованих тканинних комплексів. Ортопедія, травматологія та протезування. 2000;4:29-35.

4. Особливості хірургічної тактики при вогнепальних пораненнях судин на послідовних етапах медичної евакуації Мішалов В.Г., Коваль Б.М., Нагалюк Ю.В., Роговський В.М., Бондаревський А.О., Горак Г.В. Серце і судини. 2016; 2: 96-103.

DOI https://doi.org/10.30525/978-9934-26-226-5-28

DENSITOMETRIC CONTROL OF TREATMENT OF COMPLICATED FORMS OF PULMONARY TUBERCULOSIS

ДЕНСИТОМЕТРИЧНИЙ КОНТРОЛЬ ЛІКУВАННЯ УСКЛАДНЕНИХ ФОРМ ТУБЕРКУЛЬОЗУ ЛЕГЕНЬ

Maetniy Ye. M.
Candidate of Medical Sciences, Senior Research Officer at the thoracic surgery department SO «National Institute of Phthisiology and Pulmonology named after F.G. Yanovsky of the National Academy of Medical Sciences of Ukraine» Kyiv, Ukraine

Маєтний Є. М.
кандидат медичних наук, старший науковий співробітник відділення торакальної хірургії ДУ «Національний інститут фтизіатрії і пульмонології імені Ф. Г. Яновського Національної академії медичних наук України» м. Київ, Україна

Introduction: Tuberculosis (TB) is still a major public health concern. The treatment of tuberculosis and its complications is as relevant as it ever was. There is a need for a rapid and objective algorithm aimed at preventing and treating complications of the bronchopulmonary system

Materials and methods. In order to assess the features of surgical treatment of patients with pulmonary tuberculosis, we examined 150 patients with specific lung lesions complicated, who were treated at F.G.Yanovsky's National institute of pthisiology and pulmonology of