Early rehabilitation of patients after inguinal lymphadenectomy for carcinoma of the penis

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INTRODUCTION

Early rehabilitation of patients after inguinal lymphadenectomy for cancer of the penis is important in order to decrease morbidity and mortality. Half of patients with cancer of the penis are subjected to the inguinal lymphadenectomy, which has a high rate of morbidity and mortality. Out of 30 patients who underwent lymphadenectomy on Clinic for urology, Clinical center of Serbia, 10 received radical lymphadenectomy. Morbidity rate was 42%, and mortality rate was 10%. Other 20 patients underwent modified lymphadenectomy. Morbidity rate was 20%, while mortality rate was 0%. Kinesitherapy on the first postoperative day: breathing exercises, peripheral circulation exercises, chest massage with Wick with training of coughing and expectoration, exercise to preserve muscle strength and range of motion for upper and lower extremities, inhalation, elastic stockings on the lower extremities, along with gradual mobilization, sitting on the edge of the bed, get up and walk with assistance (all with a belt). Successful and early physiotherapy is necessary for quick recovery of operated patients, enabling their fast return to normal life and saving time and resources for the treatment of complications.

Key words: carcinoma of the penis, inguinal lymphadenectomy, early rehabilitation

ANATOMY AND PATOPHYSIOLOGY

The lower limb lymphatic system consists of lymph vessels and lymph nodes. Lymphatic vessels of legs are divided into superficial and deep. Superficial lymph vessels in the legs are located in fatty subcutaneous tissue and they collect lymph from the skin and subcutaneous tissue. Superficial lymph vessels are starting from dorsal and plantar side of foot and move upward all the way to inguinal lymph nodes. Apart from these vessels, inguinal lymph nodes receive lymph from perianal region, perineum and skin of external genital organs.

The deep lymphatic vessels are clustered around deep arterial blood vessels and end in deep inguinal lymph nodes. Inguinal lymph nodes as discussed are divided into two groups, superficial and deep. Superficial
inguinal lymph nodes lie between the skin and fascia around the final arc of saphenous vein. There are usually 8-12 of these nodes, but sometimes over 20. They are divided into 4 groups: the superior-lateral, superior-medial, inferior-lateral and inferior-medial groups. Two lower groups receive almost all the superficial lymph vessels from legs, superior-medial group receives lymph from the superficial vessels of the perineum, anus and external genital organs, and superior-lateral group receives superficial lymph vessels from gluteal region. Both groups receive superficial lymph vessels of the abdomen below the umbilicus. The deep inguinal lymph nodes are located beneath the cribriform fascia. There are 2-3 of these nodes that run along the medial edge of femoral vein. Blockage of the lymph flow result in lymphedema. Lymphatic vessels are dilating bellow the point of obstruction which leads to leakage and edema. If edema persists for longer period induration will result due to formation of collagen fibers. Prolonged lymphedema edema leads to trophic changes, known as elephantiasis, and they cause smaller or greater degree of disability.

Surgical technique for inguinal lymphadenectomy

Good knowledge of lymphatic drainage of penis allows us to perform radical anatomical dissection of regional lymph nodes. In 1948, Daseler has published the surgical technique of radical inguinal lymphadenectomy. This technique is used to remove all superficial and deep inguinal lymph nodes as well as lateral iliac nodes. Boundaries of radical lymphadenectomy are: cranially, plane from anterior superior iliac spine to the external opening of inguinal canal. Lateral edge is formed by line passing through anterior superior iliac spine 20cm lower. Medial border is formed by line that descends through pubic tubercle 15cm lower. Lowest point is crossing of these two lines. Incision is made 1.5cm below inguinal fold. Fatty subcutaneous tissue that contains lymph nodes is completely excised. Upon opening the fascia, we approach the space that contains deep inguinal lymph nodes. They are positioned in a triangle formed by long adductor muscle, sartorius muscle and inguinal ligament. The tip of this triangle is a point where femoral artery and vein are entering Hunter’s canal. Dissection is performed en bloc, with ligation of saphenous vein tributaries, as well as ligation of this vein, if necessary. This type of radical procedure has been performed for several decades, but it is now considered that this technique has high rates of morbidity and mortality.

In 1988, Catalona has published the technique of modified inguinal lymphadenectomy. Differences between this technique and radical lymphadenectomy are: shorter incision, less amount of dissection, preservation of nodes laterally of saphenous vein and caudally of oval foramen, preservation of saphenous vein, transposition of sartorius muscle and preservation of subcutaneous fatty tissue. This technique significantly lowers complication rates, particularly in terms of necrosis of skin flap, which is associated with infection, demand prolonged hospitalization, which leads to deep vein thrombosis and pulmonary embolism.

**PHYSICAL MEDICINE AND REHABILITATION**

Kinesitherapy on the first postoperative day, according to our protocol: breathing exercises, peripheral circulation exercises chest massage with Wick with training of coughing and expectoration, exercise to preserve muscle strength and range of motion for upper and lower extremities, inhalations, elastic stockings on the lower extremities, manual lymphatic drainage.

Kinesitherapy on the second postoperative day and further: the program of the first day along with gradual mobilization, sitting on the edge of the bed, get up and walk with assistance (all with a belt). Contraindications for these treatments are deep - vein thrombosis, pulmonary embolism, blood transfusion and blood elements (after two hours), acute bleeding, prolonged vomiting and febrile state (over 38,5° C). The goals of postoperative rehabilitation are to enable the walk further than 30 m, transfer from bed to toilet and back, and in long term return to work and activities of daily living.

**CONCLUSION**

Successful and early physiotherapy is necessary for quick recovery of operated patients, enabling their fast return to normal life and saving time and resources for the treatment of complications.

**SAŽETAK**

Rana rehabilitacija pacijenata nakon inginalne limfadenektomije kod karcinoma penisa je značajna u cilju smanjenja postoperativnog morbidadesa i mortalidadesa. Polovini pacijenata sa karcinomom penisa će biti uradjena inginalna limfadenektomija, kod koje postoji visoka učestalost morbidadesa i mortalidadesa. U grupi od 30 pacijenata kojima je uradjena limfadenektomija na Klinici za urologiju Kliničkog centra Srbije 10 pacijenata je podvrženo radikalnoj limfadenektomiji. Morbiditet je iznosio 42%, a mortalitet 10%. Kod ostalih 20 pacijenata je uradjena modifikovana limfadenektomija. U ovoj grupi morbiditet je iznosio 20%, a mortalitet 0%. Kineziterapija prvog postoperativnog dana: vežbe disanja, vežbe za perifernu cirkulaciju, masaža grudnog koša Wick-om i vežbe za iskašljavanje, vežbe za očuvanje mišićne snage i obima pokreta gornjih i donjih ekstremiteta, inhalacije, elastična bandaža donjih ekstremiteta, sa postepenom mobilizacijom i hodo uz pomoć fizioterapeuta (sa pojasom).

Uspešna i rana fizikalna terapija je neophodna u cilju brzog oporavka pacijenata, povratka uobičajenim životnim aktivnostima i uštede vremena i sredstava u lečenju komplikacija.

Ključne reči: karcinom penis, inginalna limfadenektomija, rana rehabilitacija
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