Primary reconstruction of neck defect after excision of metastatic melanoma of unknown primary site with regional pectoral myocutaneous flap

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INTRODUCTION

Primary reconstruction of massive neck defects presents a continuously challenging question in the field of reconstructive surgery. The reconstruction’s goals primarily include acceptable coverage for the underlying tissue, with protection of important anatomical structures, and, secondly, acceptable and furthermore desirable aesthetic appearance if possible.

Metastatic melanoma of unknown primary (MMUP) presents a specific entity with many characteristics that underlies the need for adequate therapeutic approach. It is broadly described in literature. The capricious presentations of the disease itself can be found in different reports, for example: 1.7 kg lymph node axillary metastasis [1], lung metastasis [2], right atrial metastasis with pericardial effusion [3], midbrain und inguinal metastases [4], skin – colored skin-fixed noduli with inguinal mass, rectal wall metastasis, lung metastasis and liver metastases [5], adrenal metastasis with subcutaneous metastatic focus [6], or simply in form of inguinal swelling that presents itself via enlarged lymph node. All of these are advocates of either the melanoma regression theory, or transformation theory, which includes the appearance of aberrant melanocyte within the lymph node [7]. As all of the reports described, despite the meticulous diagnostic procedures, primary melanoma was not diagnosed.

We present two cases of large neck tumor mass that were surgically treated in the Clinic for Plastic and Reconstructive Surgery, Clinical Center Niš, Serbia, which were diagnosed with MMUP.

CASE REPORTS

Case 1

A 47-year-old male was admitted to the clinic with a large tumor mass on the right side of the neck. The patient reported that tumor mass appeared two months before and grew until it reached the preoperative size (Figure 1). At the time of admission, general health condition was inconspicuous, without concomitant diseases. A thorough examination was performed, including physical examination of the skin, anus, genitalia, and adnexae; ophthalmoscopy, otorhinolaryngology examination, rectoscopy,
thoracic X-rays, abdominal ultrasound, computed tomography (CT) scans of the thorax and abdomen. Anamnestically, no surgical procedures had been performed prior to the admission. The CT-scans showed that no major blood vessels were affected by the tumor mass. Primary melanoma or other cutaneous lesions, as well as other pathological findings, were not diagnosed.

The surgery was performed under general anesthesia. Surgery planning was thorough, because of the relations with the vital structures in the neck. The excision was methodically performed, continued by a neck dissection. The dimensions of the excised tumor mass were 12 × 9 × 8 cm. Afterwards, ipsilateral pectoralis major (PM) myocutaneous pedicled flap was harvested, raised und placed into the defect. The suturing was performed in two layers, over a suction drainage. The secondary defect was covered with split-thickness skin grafts harvested from the right thigh. The chest wound was sutured over the suction drain. Initial postoperative period was uneventful. Following histopathological examination of the excised tumor mass showed enlarged lymph node with melanoma metastasis. The drainage was removed on the fourth postoperative day; approximately 95% of the skin grafts healed and small areas healed by secondary epithelization (Figure 5). The sutures were removed on the 13th postoperative day.

On examination three months post-surgery, the patient described the aesthetic outcome as good. Minor problems with arm movements were nonetheless reported by the patient.

**Case 2**

A 54-year-old male was admitted with a large tumor mass on the left supraclavicular region. The patient reported the appearance of a small tumor mass two and a half months prior to the admission, which successively grew until it reached the preoperative size. Venous skin congestion surrounding the tumor mass was also noted by the admission check-up (Figure 3). At the time of admission patient was not suffering from any concomitant diseases. The step-by-step diagnostic procedures as in the first case were performed. Primary melanoma or other cutaneous lesions, as well as other pathological findings, were not diagnosed. The surgery was performed under general anesthesia. The tumor mass resection was performed, followed by ipsilateral lower neck dissection. The dimension of the excised tumor mass was 15 × 15 × 10 cm. Using the mid-clavicular incision line, lateral margin of the left PM muscle was approached; the flap was dissected and raised (Figure 4), and subsequently turned into the defect. The flap was sutured and covered with split-thickness skin grafts harvested from the right thigh. The chest wound was sutured over the suction drain. Initial postoperative period was uneventful. Following histopathological examination of the excised tumor mass showed enlarged lymph node with melanoma metastasis. The drainage was removed on the fourth postoperative day; approximately 95% of the skin grafts healed and small areas healed by secondary epithelization (Figure 5). The sutures were removed on the 13th postoperative day.

On examination three months post-surgery, the patient described the aesthetic outcome as good. Minor problems with arm movements were nonetheless reported by the patient.
Despite the applied radiotherapy, twelve months after the surgery the patient developed generalized disease with multiple cerebral metastases. The patient died fourteen months after the primary surgical treatment.

**DISCUSSION**

MMUP presents a clinically completely different entity compared to melanoma of known primary (MKP); nevertheless, genetic researches show rise in BRAF and NRAS mutations, which resemble the genotype of cutaneous melanoma [8–10] and not of the mucosa [9]. Both mutations have no significant prognostic impact on the clinical outcome [9, 10]. The number of metastatic lymph nodes remains the most significant prognostic factor for overall survival [10]. One study has suggested that AJCC stage and time to disease progression, and not the initial metastatic load, nor the mutational status, displays the important prognostic factors [11].

MMUP presents a clinical entity that has a different prognosis to that of the MKP. As mentioned before, the number of involved lymph nodes involved presents a negative prognostic factor, but the prognosis itself is also influenced by the clinical form of the disease. In comparison to patients with MKP, the patients with MMUP showed better prognosis [12]; however, in-transit or satellite metastases present an additional unfavorable effect [13]. To date, surgical treatment remains the initial therapeutic modality, unless absolute contraindications for surgical treatment are present.

The role of appropriate reconstruction presents an open question in the field of reconstructive surgery. The role of regional flaps remains, to date, unquestioned. A number of papers on this topic only underline the significance of the regional PM flap. Many advantages using this flap are mentioned in the literature, e.g. vitality of the flap, reasonably short time of recovery, favorable aesthetic outcome at the donor site [14], versatility and excellent reach in the neck region [15], cost of surgery of the regional vs. free flaps. Also, minor but notable or even no postoperative complications using PM flap were mentioned in the latest literature [16, 17].

Providing that regional PM muscle flap dates from the second third of the 20th century, as described in the literature, and that it has until now been used as a reliable modality for treatment of diverse head and neck defects, it presents a good modality for the treatment of the defects following the surgery of MUP. The significance of free flaps stays undisputed, but the economical aspect of the surgery costs and the recovery time could be also be considered, especially when it comes to use of the PM muscle flap in the developing societies. A thorough patient examination remains of foremost significance, because small or unrecognized skin or adnexae lesions could present the primary site of the later diagnosed metastatic disease [18].

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**Figure 4.** Tissue defect medial of the left shoulder; after the excision and neck dissection, the pedicled pectoralis major muscle flap is dissected from distal and raised. The clavicle is notable in the middle of the tissue defect; proximal to the clavicle, altered anatomical tissue organization is demonstrable. Major blood vessels are not recognizable in this photograph.

**Figure 5.** Postoperative appearance during the dressing change, skin grafts are healed, the venous congestion has declined; the wound shows no signs of irritation or infection.
REFERENCES

1. Ørnstrup MH, Crewe B, Stolle LB. Giant metastatic melanoma arising from an unknown primary site. Ugeskr Laeger. 2014; 176(44):V08130487. [Article in Danish] [PMID: 25347250]


**Subendocardial hemorrhages in a case of extrapericardial cardiac tamponade – A possible mechanism of appearance**

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**SUMMARY**

**Introduction** Subendocardial hemorrhages are grossly visible bleedings in the inner surface of the left ventricle, the interventricular septum, and the opposing papillary muscles and adjacent columnae carneae of the free wall of the ventricle. These are commonly seen in sudden profound hypotension either from severe blood loss from “shock” in the widest sense and, even more often, in combination with brain injuries.

**Case Outline** We present a case of a 38-year-old man, injured as a car driver in a frontal collision, who died c. 45 minutes after the accident. The autopsy revealed severe chest trauma, including multiple right-sided direct rib fractures with the torn parietal pleura and right-sided pneumothorax, several right lung ruptures, and a rupture of one of the lobar bronchi with pneumomediastinum, and prominent subcutaneous emphysema of the trunk, shoulders, neck and face. The patchy subendocardial hemorrhage of the left ventricle was observed. The cause of death is attributed to severe blunt force chest trauma.

**Conclusion** We postulate pneumomediastinum leading to extrapericardial cardiac tamponade as the underlying mechanism of this subendocardial hemorrhage.

**Keywords:** forensic pathology; subendocardial hemorrhage; extrapericardial cardiac tamponade; pneumomediastinum; subcutaneous emphysema; lung injury

**INTRODUCTION**

Autopsy reveals superimposed images of both injuries and organ changes generated by the injuries. Our task is to put these images in chronological order, and to make the reconstruction of the injury event. In order do it properly, a good understanding of the pathophysiological mechanisms and injury patterns is required.

Subendocardial hemorrhages are grossly visible bleedings in the inner surface of the left ventricle, the interventricular septum, and the opposing papillary muscles and adjacent columnae carneae of the free wall of the ventricle. The hemorrhages are flame-shaped and confluent, not petechial. They can appear extremely rapidly, within a few heartbeats [1], and can even be found in trauma deaths with nearly immediate circulatory arrest [2]. These are commonly seen in sudden profound hypotension, either from severe blood loss or from “shock” in the widest sense [1, 3], and, even more often, in combination with brain injuries [4]. These hemorrhages were sometimes termed “shock lesions”, or named after Sheehan [5].

In the case under review here, we present an intriguing mechanism of subendocardial hemorrhages appearance.

**CASE OUTLINE**

A 38-year-old man was injured as a car driver in a frontal collision. He died c. 45 minutes after the accident, on the way to the hospital. An autopsy was performed the following day.

The deceased was 176 cm tall and weighed approximately 75 kg. Along with multiple small skin excoriations and bruises of the extremities, the external examination revealed prominent subcutaneous emphysema of the trunk, shoulders, neck and face (Figure 1). The internal examination showed multiple right-sided direct rib fractures (*fracture en dedans*) with the torn parietal pleura and right-sided pneumothorax. The right lung was partially loose and collapsed. On the lateral side of the right lung, there were three ruptures up to c. 2 cm in depth, which corresponded to the fractured ribs. A relatively small amount of free blood (c. 300 ml) was found in the right pleural cavity. There was a rupture in the right lung hilus with one of the lobar bronchi lacerated (Figures 2a and 2b), while the mediastinal connective tissue was crepitant to the touch. Left lung, pericardium, heart and great thoracic vessels were intact and without any visible injuries. Patchy subendocardial hemorrhage of the left ventricle was observed (Figure 3). The autopsy also revealed a longitudinal liver laceration, on the lower side of the right lobe with c. 500 ml of free blood in the abdominal cavity, and a right-sided parietal skin laceration with the isolated contrecoup fracture of the left bony orbit and several left frontal lobe brain contusions. The victim’s blood and urine alcohol concentrations were found to be 1.01 g/l and 1.17 g/l, respectively. The toxicological analysis