A case of late brachial plexopathy after chemotherapy and radiotherapy

Případ pozdní brachiální plexopatie po chemoterapii a radioterapii

Dear Editor,

Radiation-induced plexus neuropathy refers to a rare late complication of radiotherapy administered to the supraclavicular area and upper part of the thoracic wall. Radiation-induced brachial plexopathy (RIBP) has been reported as a result of radiation therapy in the treatment of lung, breast, nasopharynx and thyroid cancer, sarcoma, diffuse large B-cell lymphoma, schwannoma and malignant peripheral nerve sheath tumour (primary plexus tumours) involving the neck, shoulder and upper thorax [1]. The latent period between radiation exposure and clinical manifestations of plexopathy may vary by as much as 1–34 years [2]. Differential diagnosis may prove to be challenging because the symptoms resemble those of the neoplastic involvement of the brachial plexus. Electrophysiological studies are valuable diagnostic tools for the assessment of patients with suspected brachial plexopathy [3].

A 63-year-old female presented with paresthesias and weakness in her left arm distally to the elbow. She reported experiencing shoulder pain 3 years previously, with motor and sensory deficits in the left arm during the same period. She had undergone physical therapy, resulting in partial improvement of pain, while the motor and sensory deficits persisted. She had undergone left mastectomy approximately 20 years previously, followed by chemotherapy with regional radiotherapy. She was also treated with 50 Gy of radiation in 24 fractions to the internal mammary region and axillary and supraclavicular nodes. Other coexisting conditions included type 2 diabetes mellitus, arterial hypertension and obesity.

During the neurological examination, the patient’s effort was graded on a Medical Research Council scale of 0–5: muscle power 3/5 for the abduction in the left shoulder; 3/5 for the left forearm flexion; 4/5 for the left forearm extension; 1/5 for the left wrist flexion; 1/5 for the left wrist extension; 0/5 for the left thumb abduction and 0/5 for the abduction of the second and the fifth digits of the left hand. Her motor examination revealed the presence of benediction and partial claw hand sign on the left hand, with minimal atrophy in semiflexion posture of the fourth and the fifth digits and abductor digiti minimi muscles (Fig. 1).

Electromyographic studies are shown in Tab. 1. EMG sensory nerve conduction tests failed to elicit left lateral antebrachial and bilateral medial antebrachial cutaneous nerve responses. Needle EMG examination revealed the presence of denervation potentials in the left abductor pollicis brevis and extensor digitorum communis muscles, while signs of neurogenic involvement were identified in the muscles innervated by C5-6-7-8 and T1. Myokymic discharges were observed from the deltoid, biceps and triceps muscles on needle EMG. Somatosensory evoked potential could not be obtained by stimulation of the left median nerve. These findings were believed to be suggestive of an involvement of the upper-medial trunks and particularly, the medial and posterior cords of the lower trunks of the brachial plexus. MRI of the brachial plexus could not be performed due to the excessive obesity of the patient. In the CT examination, the left axillary-supraclavicular study showed no evidence of tumour infiltration. In CSF examination, the protein level was 46 mg/dL slightly above the limit (20–45 mg/dL) and the cell number was 3 (0–5/mm³) and there was no increase.

Radiation-induced brachial plexopathy, which was more common in the past, is now a relatively rare complication of modern radiotherapy, the incidence of which is dependent on several factors including total...
In electrodia gnostic stud ies, 90% of pa-
dose, dose per fractio n, pat ient age and
patients exhibited nerve conductio n abnor-
ons the patient and cannot be localized. The
asymmetrical shoulder girdle and arm mus-
cular power loss is generally realized after
A CASE OF LATE BRACHIAL PLEXOPATHY AFTER CHEMOTHERAPY AND RADIOTHERAPY

discharge exhibiting typical changes
This sign is the result of the weakness of the
lumbrical muscles in the hyperextension of the
metacarpals of the fourth and the fifth
1. Peppoloni G, Baglioni T, Dotti MT et al. Brachial plex-
opathy due to breast cancer metastases: electrophysio-
logical and imaging findings. Neurol Sci 2018; 39(8):
2. Johansson S, Svensson H, Denekamp J. Timescale
of evolution of late radiation injury after postopera-
tive radiotherapy of breast cancer patients. Int J Ra-
S0360-3016(00)00674-4.
3. Boyaciyan A, Oge AE, Yazici J et al. Electrophysiol-

gen of developing RIBP. Patie nts sh ould be in-
creasing regimens in adjuvant irrad iation of pat ients
this sign, resulting from the w eakness of the
in partial flexion of the last two digits when
na webu csnn.eu naleznete rozšířenou verzi tohoto článku.

Tab. 1. Values of motor nerve conduction study.

<table>
<thead>
<tr>
<th>Nerve</th>
<th>Stimulation</th>
<th>Onset Latency (m/s)</th>
<th>Amplitude (µV)</th>
<th>Onset NCV (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L median – APB</td>
<td>1. wrist</td>
<td>4.15</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. elbow</td>
<td>9.35</td>
<td>12.0</td>
<td>44.2</td>
</tr>
<tr>
<td></td>
<td>3. axilla</td>
<td>12.95</td>
<td>10.6</td>
<td>52.8</td>
</tr>
<tr>
<td></td>
<td>4. erb</td>
<td>17.35</td>
<td>0.4</td>
<td>50.0</td>
</tr>
<tr>
<td>L ulnar – ADM</td>
<td>1. wrist</td>
<td>2.75</td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. below elbow</td>
<td>7.30</td>
<td>4.5</td>
<td>44.0</td>
</tr>
<tr>
<td></td>
<td>3. above elbow</td>
<td>8.90</td>
<td>4.8</td>
<td>65.6</td>
</tr>
<tr>
<td></td>
<td>4. axilla</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>5. erb</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>L radial – EIP</td>
<td>1. elbow</td>
<td>5.55</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. spiral groove</td>
<td>7.05</td>
<td>0.4</td>
<td>76.7</td>
</tr>
</tbody>
</table>

ADM – abductor digitii minimi; APB – abductor pollicis brevis; EIP – extensor indicis proprius; NCV – nerve conduction velocity