Hybrid repair of multilevel lesions of the brachiocephalic arteries.  
Chernyavskiy Mikhail PhD, Chernova Daria, Chernov Artemii, Zherdev Nikolai 
Almazov National Medical Research Centre, 
St. Petersburg, Russian Federation  

Introduction: 
Multilevel significant atherosclerotic disease involving the carotid bifurcation, the ipsilateral or contralateral common and distal parts of internal carotid arteries presents difficult management problem. The main objective of our research is to assess the results of hybrid repairs of multilevel and tandem stenosis of brachiocephalic arteries.

Methods: 
From December 2016 in clinic of the Vascular and Intervention Surgery department Almazov National Medical Research Centre were treated 21 patients with multilevel atherosclerosis lesions of carotid arteries. The patient's age were from 49 to 82 years old. The distributions of lesions were: 10 patients with right internal carotid artery (ICA) and brachiocephalic trunk (BCT) hemodynamic stenosis, 9 - with left common (CCA) and internal carotid arteries stenosis and 2 – with tandem stenosis of bifurcation and distal part of internal carotid.

9 patients with combined cardiologic pathology requiring cardiosurgical treatment. In all cases were performed hybrid procedures which included carotid bifurcation endarterectomy and stenting affected artery (Table 1). Follow-up consisted of clinical assessment, duplex ultrasound and MSCT-angiography during 3-6 months after treatment.

Results: 
Technical success was 100% and there was no neurologic morbidity and mortality at 30 days. The 3 to 6 months results after operations are the absence of thrombosis, stroke and complications, including after aortocoronary bypass.

Case presentation: 
A 60-year-old man with multilevel lesions carotid artery (fig.1, fig.2).

Figure 1. Computer tomography angiography (CTA) showing the right internal carotid artery stenosis 85%.

Figure 2. Computer tomography angiography (CTA) showing the brachiocephalic trunk stenosis 80%.

Surgical technique: 
1 step Carotid endarterectomy from the right internal carotid artery
2 step Balloon angioplasty with stenting brachiocephalic trunk

Conclusions: The use of hybrid surgical interventions in multilevel lesions of brachiocephalic arteries allows to reduce the risk of TIA and ischemic strokes in patients, and achieve immediate satisfactory results after the surgical treatment. It demonstrates an effective and safe correction of hemodynamically significant tandem stenosis of brachiocephalic arteries, avoiding neurological complications during surgical treatment of the patients with combined cardiologic pathology.

References:

<table>
<thead>
<tr>
<th>N patients</th>
<th>Lesions</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Right ICA + BCT</td>
<td>Carotid bifurcation Endarterectomy + stenting of BCT</td>
</tr>
<tr>
<td>9</td>
<td>Left CCA + ICA</td>
<td>Stenting of CCA + Carotid bifurcation Endarterectomy</td>
</tr>
<tr>
<td>2</td>
<td>ICA + distal part of ICA</td>
<td>Stenting distal stenosis of ICA + Carotid bifurcation Endarterectomy</td>
</tr>
</tbody>
</table>

Table 1.