About author

Selitsky Stan, postgraduate student at the School of Computer Science and Technology; e-mail: selitsky@yahoo.com

CHARACTERISTICS OF LUMEN OF THE ANTERIOR INTERVENTRICULAR BRANCH WITH DIFFERENT VARIANTS OF CORONARY BRANCHING IN HEARTS WITH MYOCARDIAL BRIDGING


Stavropol State Medical University, Russian Federation

The anterior intraventricular branch has been examined in the systole phase on 60 antemortem angiograms with left-anterior and right-vertebral variants of branching of coronal arteries in people of second adult age with a myocardial bridge. Data on a comparative examination of the lumen of the anterior intraventricular branch at the left-vertebral and right-vertebral variants of branching of coronal arteries in the subepicardial and intramural departments of the main highway are presented.

Keywords: myocardial bridge, anterior interventricular branch, systole, left variant of coronary branching, right variant of coronary branching, internal diameter
Исследована передняя межжелудочковая ветвь в фазу систолы на 60 прижизненных ангиограммах с левовенечным и правовенечным вариантами ветвления венечных артерий у людей второго периода зрелого возраста с миокардиальным мостиком. Представлены данные о сравнительном изучении просвета передней межжелудочковой ветви при левовенечном и правовенечном вариантах ветвления венечных артерий в субпикардиальных и интрамуральных отделах основной магистрали.

Ключевые слова: миокардиальный мостик, передняя межжелудочковая ветвь, систола, левовенечный вариант ветвления, правовенечный вариант ветвлений, внутренний диаметр


<table>
<thead>
<tr>
<th>Дивизион уровня</th>
<th>Дивидендный компонент</th>
<th>Диаметр внутренний AIT, мм</th>
<th>CBCLA</th>
<th>RCBCA</th>
<th>Mann – Whitney U-тест</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>MT</td>
<td>3.17 [2.94; 3.52]</td>
<td>3.21 [2.17; 2.33]</td>
<td>12.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>3.16 [2.94; 3.49]</td>
<td>2.24 [2.19; 2.41]</td>
<td>16.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>MT</td>
<td>3.16 [2.93; 3.47]</td>
<td>2.15 [2.11; 2.36]</td>
<td>16.5</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>3.09 [2.89; 3.45]</td>
<td>2.16 [2.11; 2.35]</td>
<td>16.5</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>MT</td>
<td>3.05 [2.87; 3.42]</td>
<td>2.17 [2.12; 2.39]</td>
<td>19.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>3.04 [2.79; 3.40]</td>
<td>2.15 [2.12; 2.39]</td>
<td>17.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>MT</td>
<td>2.46 [2.53; 2.59]</td>
<td>1.78 [1.56; 1.98]</td>
<td>19.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DD</td>
<td>2.38 [2.21; 2.56]</td>
<td>1.49 [1.28; 1.69]</td>
<td>19.0</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

Таблица размеров просвета передней межжелудочковой ветви

Note: p is the significance of differences between LCBCA and RCBCA; MT – the main trunk of the branch; DD is a division derivative that continues the main line of the AIT.

In the average third of the anterior interventricular groove on hearts with LCBCA and RCBCA, after the III branching of the AIT, a «systolic expansion» of the vessel is formed through 4.57 mm [3.89; 5.31] and 5.64 mm [3.19; 6.71] (U=342, Z=–1.59, p=0.110), respectively. The lumen of the examined artery in this section achieves the greatest increase in objects with LCBCA – 3.50 mm [3.23; 3.88], while at RCBCA, it is 2.33 mm [2.28; 2.93] (U=39, Z=–6.08, p<0.0001). The length of the «systolic» extension was longer on coronary angiograms with RCBCA (5.50 mm [4.64; 5.84]) compared with LCBCA (2.90 mm [2.19; 2.43]).


Medical New of North Caucasus.

Table 1 The size of the AIT lumen during subepicardial vessel

The myocardial bridge is a common anomaly of the coronary arteries [1]. The presence of this anatomical phenomenon is a significant predictor. Some researchers note structural changes in the intramural artery wall, increasing its propensity for spasm and thrombosis [2–5]. Myocardial bridges are thought to play an essential role in the pathogenesis of acute coronary syndrome in the absence of atherosclerotic alterations of coronary arteries [6]. Therefore, the study of coronary arteries with myocardial bridges remains relevant.

Modern literary data demonstrate the regularities of the topography of the myocardial bridges [7], characterize its length [8], and establish correlations between the bridge length and the size of the ventricular heart complex [9]. However, the evolution of the lumen of the coronal arteries in different branching phases of the cardiac cycle has not been studied before.

Purpose of the study: to carry out a comparative analysis of changes in the lumen of the anterior interventricular branch (AIV) in the left vein (LCBCA) and right vein (RCBCA) variants of coronary artery branching (BVCA) in the systole phase on hearts with a myocardial bridge.

Material and Methods. Sixty intravital coronary angiograms with myocardial bridges in persons in the second period of adulthood were examined. For LCBCA and RCBCA, 30 archival records of each option were considered. Inclusion criteria for the study were objects with a myocardial bridge length of at least 20 mm and AIT stenosis within the myocardial bridge from 50 to 70%. Consideration of the AIT lumen was carried out in the systole phase of the heart, both in the subepicardial and intramural sections. Morphometric parameters were calculated using a special computer program «RadiAnt DICOM Viewer» (Poznan, Poland). Particular attention is paid to the comparative characteristics of the vessel diameter during immersion, passage and exit of the AIT from under the myocardial bridge.

Statistical processing of the obtained data was carried out using the program SPSS Statistics 22 (IBM, USA). Morphofunctional indicators were recorded as a median, the values of the 25th and 75th percentiles (Me [25%; 75%]). The comparison was carried out according to the Mann – Whitney U-test. Differences were considered statistically significant at p<0.05.

Results and Discussion. As a result of the division of the left coronary artery, the AIT is formed, which in the systole phase on hearts with BVCA has a diameter of 2.41 mm [2.19; 2.43], and with LCBCA – 3.19 mm [2.97; 3.62] (U=12, Z=–6.48, p<0.0001). It was revealed that AIT forms 4±1 subepicardial ramifications in all objects, with division levels I–III located before the vessel enters the intramural section along the myocardial bridge. At the same time, generation VI AIT is formed after the artery exits the tunnel section. In subepicardial generations of hearts with BVCA, the lumen of the main AIT artery statistically significantly prevailed over its value during BVCA along its entire length (Table).


TABLE 1 THE SIZE OF THE AIT LUMEN DURING SUBEPICARDIAL VESSEL

Note: p is the significance of differences between LCBCA and RCBCA; MT – the main trunk of the branch; DD is a division derivative that continues the main line of the AIT.
the presence of the bridge [7] has been noted in the studies, as well as the predominance of the height of the myocardial bridge in the right-ventricle type of blood supply of the heart compared to mixed [10]. In the present work, it was found that the diameter of the AIT in the proximal part of the vessel before entering the muscle bridge prevails over its value in the tunnel section and cultural segment, which is confirmed in the works of several researchers [11, 12]. Other authors, by contrast, consider that there are no significant differences in the diameter of the three arteries concerned [13]. Our findings on the considerable narrowing of artery lumen in hearts with a myocardial bridge to the systole phase are consistent with the results of other researchers who noted that the pronounced artery compression in the systole affects the fractional flow [2, 6].

Conclusions. A comparative analysis of changes in the lumen of the AIT during the systole phase of the hearts with a myocardial bridge showed that the internal diameter was statistically significantly more prevalent in objects with LCBCA throughout the main vascular line. With all BVCA in the systole phase, the formation of a «systolic expansion» of the AIT before its immersion into the myocardium in the region of the myocardial bridge was established. This section of the AIT has a greater length on coronary angiograms with RCBCA compared to objects with LCBCA. A significant narrowing of the lumen of the periphery is established at the areas of immersion and return from the tunnel part of the artery with the most significant reduction in diameter in the area of the outlet of the myocardium vessel to the epicardium.

In this way, the obtained data demonstrate the dynamics of the change in the luminosity of the PML into the systole phase at different BBBA on hearts with a myocardial bridge.

Disclosures: The authors declare no conflict of interest.

References
The occurrence of unformed enteric fistulas remains an urgent problem. This is due to the low effectiveness of conventional treatment methods, leading to an increase in the number and progression of fistulas and death. Thirty patients who underwent elective abdominal emergency surgeries have been studied. Two to 5 fistula tracts have been identified; 11 (36.7 %) patients had complex fistulas. Twenty-three patients were operated on 3 to 36 times in other healthcare facilities. We operated patients after the onset of fistulas which was usually between 2 and 4 weeks. In 26 (86.7 %) cases, radical surgery was performed to remove small bowel carrying fistulas, mesentery and a segment of the anterior abdominal wall involved in the conglomerate; 3 patients underwent a bilateral disconnection of the fistulas due to severe condition, and one patient received a unilateral procedure. Thus, the treatment of unformed enteric fistulas is a complicated problem. Carrying out radical surgical treatment of this pathology is possible subject to the principles of preoperative preparation and the technical features of the implementation of the surgery.

Keywords: unformed small bowel fistulas, complex small bowel fistulas, multiple small bowel fistulas, curative therapy of unformed small bowel fistulas

Возникновение несформированных тонкокишечных свищей остается актуальной проблемой, обусловленной малой эффективностью общепринятых методов лечения, часто приводящих к увеличению количества и прогрессированию свищей и, как следствие, летальному исходу. Проанализированы результаты лечения 30 больных, перенесших плановые и экстренные оперативные вмешательства на органах брюшной полости. Выявлено от 2 до 5 свищевых ходов, у 11 (36,7 %) больных – многоуровневые свищи. Двадцать три больных были опиерированы от 3 до 36 раз в других лечебных учреждениях. Оперативное лечение выполнялось в сроки от 2 суток до 4 недель. В 26 (86,7 %) случаях выполнено радикальное удаление тонкой кишки, несущей свищ, брыжейки и вовлеченного в конгломерат участка передней брюшной стенки, 3 больным из-за тяжести состояния выполнено двустороннее и 1 одностороннее отключение свищей. Таким образом, лечение несформированных тонкокишечных свищей является чрезвычайно сложной проблемой. Проведение радикального хирургического лечения данной патологии возможно только при соблюдении принципов предоперационной подготовки и технических особенностей выполнения оперативного пособия.

Ключевые слова: несформированные тонкокишечные свищи, многоуровневые тонкокишечные свищи, множественные тонкокишечные свищи, радикальное лечение несформированных тонкокишечных свищей