ISAKOS

International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine

10th Biennial ISAKOS Congress • June 7-11, 2015 • Lyon, France

Paper #58

Effectiveness of Oblique Osteochondral Plugs Transplantation for Lateral Type Osteochondritis Dissecans of the Elbow: Comparison with Central Type

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Summary:
Treatment outcomes of oblique osteochondral plugs transplantation for lateral type osteochondritis dissecans (OCD) of the elbow were evaluated and compared with those of the central type. Our method facilitated reconstruction of lateral margin of capitellum with stable fixation, and the postoperative outcomes were equivalent to those of central type OCD.

Abstract:
Background: The effectiveness of surgical treatment for central type osteochondritis dissecans (OCD) of the elbow, in which the lesion is localized in the center of the joint, is established. However, for lateral type OCD, where the lateral margin of capitellum is damaged, an appropriate surgical method with positive results has yet to be clearly identified. We developed a lateral margin reconstruction method for lateral type OCD, by transplanting obliquely-shaped harvested osteochondral plugs into the lesion. The aim of this study was to investigate and compare treatment outcomes of our oblique osteochondral plugs transplantation for lateral type OCD with that of conventional osteochondral plugs transplantation used for central type OCD.
Materials and Methods: Our subjects were 22 patients (mean: 14 years old) who underwent surgical treatment of the elbow OCD with follow-up periods of longer than one year (mean follow-up observation: 2 years 8 months). Their 19 OCD lesions included 12 central and 9 lateral types. All subjects underwent osteochondral plugs transplantation, with the plugs harvested from a non-weight bearing site of the lateral femoral condyle. Conventional cylindrical-shaped osteochondral plugs were used for the central type OCD, and oblique-shaped osteochondral plugs including the lateral wall of femoral condyle were used for the lateral type OCD. The oblique-shaped osteochondral plugs were harvested with an approximate 30 to 45 degree angle (1 to 2 plugs with diameter of 6.5 or 8.5 mm), to fit into the holes drilled in the articular surface in a narrow-viewed operative field of the elbow. The treatment outcomes were evaluated using the Japanese Orthopaedic Association (JOA) Elbow Score, range of motion of the elbow joint, and plain X-ray images.
Results: Postoperatively, the JOA scores for the central type improved from 74 to 98 points, and those of the lateral type improved from 64 to 95 points. Range of motion of the central type improved from 129° flexion and – 11° extension to 140° flexion and -1° extension; the lateral type improved from 116° flexion and – 17° extension to 136° flexion and -2° extension. X-ray images showed a slightly remaining deformation of the capitellum in 2 patients with lateral type.
Discussion: In lateral type OCD of the elbow, conventional cylindrical-shaped osteochondral plugs are difficult to perpendicularly insert into the articular surface congruous with the radial head in a restricted operative field. Even when successfully inserted, stable fixation may not be obtained, due to displacement or breakage of the inserted plugs. Our oblique osteochondral plugs transplantation for the lateral type facilitated insertion of the plugs congruently with the articular surfaces in a restricted operative field, and achieved reconstruction of the lateral margin of capitellum with stable fixation, with relative ease of operative technique, leading to favorable outcome equivalent to that for the central type; thus, this technique appears suitable for lateral type OCD.