Journal of Orthoplastic Surgery
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Bilateral femoral trochlear hemiarthroplasty for treatment of isolated chondral lesions: A case report

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Abstract

Management of patellofemoral chondral defects in younger adults can be challenging. Isolated chondral defects are rare and challenging to treat. We report a case of bilateral knee pain with isolated chondral defects in the femoral trochlea. A 32-year-old Teacher with significant patellofemoral symptoms unable to walk without crutches underwent successful bilateral trochlear hemiarthroplasty. The patient is pain-free after seven-years follow-up with a preoperative WOMAC score of both knees of 17.5 to a seven-years post-operative WOMAC score of 98.5. The purpose of this case is to highlight this technique for isolated trochlear lesions which resulted in excellent outcome in our case.

Keywords: Trochlear lesion, Hemiarthroplasty, anterior knee pain.

Introduction:

Management of patellofemoral chondral defects in younger adults can be challenging [1]. Isolated Cartilage defects in femoral trochlea are relatively rare [2, 3]. Surgical options following the failure of conservative management include microfracture, autologous chondrocyte implantation (ACI), osteochondral autograft transfer system (OATS), and osteochondral allograft implantation [1]. There is no literature on the patellofemoral replacement for focal trochlear lesions. There is no available evidence for hemiarthroplasty for isolated cartilage defects. We report a rare case of bilateral isolated trochlear chondral lesion of the knee, the novel surgical method used in the management and with successful seven-year functional outcome following bilateral trochlear replacement for isolated large chondral lesions in the femoral trochlea.

Case report

The 32-year-old male teacher presented to our clinic with painful knees for 24 months. The pain started in the right knee first followed by the left knee. This was predominantly anterior knee pain, aggravated by kneeling, squatting, bending, getting up after prolonged sitting as well as going up and down the stairs. He denied any history of injury to his knees. Conservative management including analgesics, physiotherapy and activity modifications failed to give him substantial symptomatic benefit. He had an arthroscopic partial medial meniscectomy in another hospital but with no benefit. He reached to a stage where he could no longer walk without using bilateral axillary crutches. There were no significant co-morbidities.

Examination revealed significant patellofemoral tenderness in both knees. Patello-femoral tracking was normal. X-rays did not reveal any obvious abnormality. MRI scan of the left knee reported low-grade chondromalacia patellae. MRI scan of the right knee was reported to be normal. Bilateral knee arthroscopies were undertaken which revealed a bilateral large isolated chondral lesion of the central trochlear grove. The right and left patellar chondral surfaces were normal. The rest of the medial and lateral compartments were also normal in both knees. Thorough pre-operative counselling was carried out with emphasis on referral to a tertiary hospital for possible OATS /ACI. He was fully aware of the results of OATS/ ACI implantation and understands that patellofemoral replacement is considered as a last resort after all the reconstructive surgical options fail to improve the symptoms. However, the patient was keen to have only patellofemoral replacement and refused other surgical options.

Surgery was therefore planned for him in the form of patellofemoral replacements. The intraoperative assessment confirmed a large chondral lesion over the trochlea with a normal patellar articular surface [fig.1] and hence, isolated trochlear replacement using Zimmer implant [fig.2] was carried out on the right knee. The patient noted a dramatic pain relief and excellent functional outcome [fig. 3, 4].

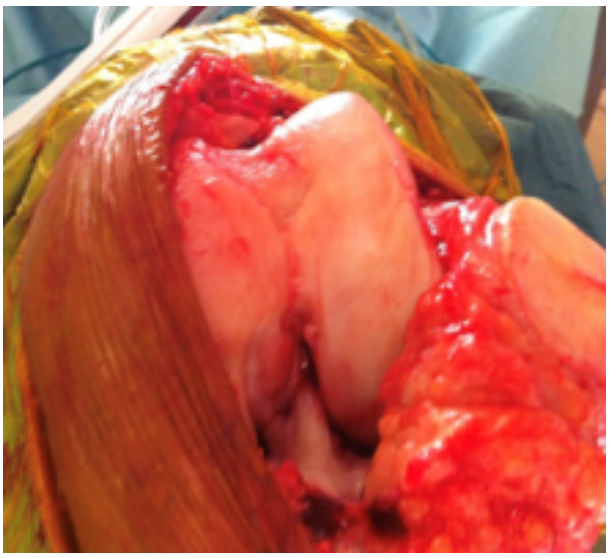

Figure (1): Intraoperative picture showing trochlear lesion

Figure (2): Intraoperative picture of Trochlear Hemiarthroplasty

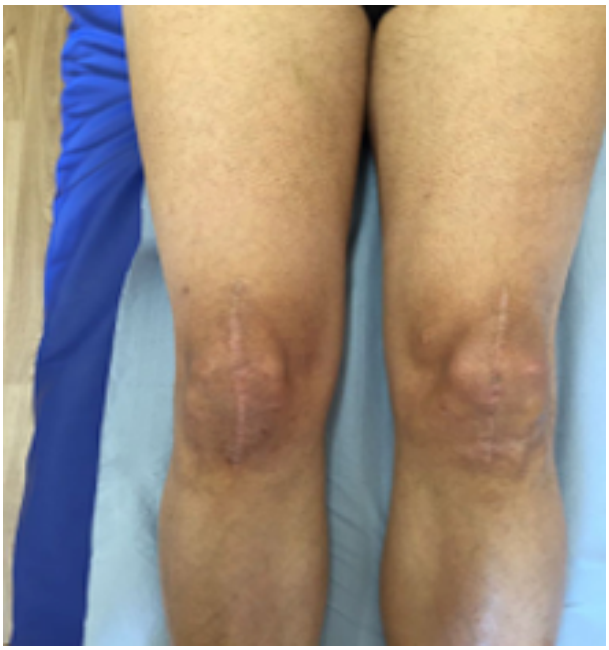

Figure (3): Clinical picture showing full knee extension

Figure (4): Clinical picture showing full knee flexion

Encouraged by the results of the right side, he underwent a similar procedure in the left knee after three months which was also successful. The patient is very satisfied with the outcome and his recent seven-year post-surgery follow-up showed a pain-free full range of movements. His preoperative WOMAC score of both knees was 17.5 and his post-operative WOMAC score is 98.5 suggesting a significant improvement in his stiffness, pain and functional activities.

Discussion

Isolated trochlear chondral lesions are quite rare. Trochlear injuries are described as lesions secondary to primary lesions in the patella [4]. The trochlea has medial and lateral facets with a shallow grove dividing them. The thickness of articular cartilage varies significantly depending on the location within the trochlea. The thickness of trochlear cartilage is 3.7mm and 2mm in the periphery and patellar cartilage thickness is 7mm [1].

According to Morgan- Jones isolated trochlear lesions are possible due to the relative mobility of patella and their difference in cartilage thickness. Studies have shown that treatment modalities in treating isolated trochlear lesions are limited and have variable results. Microfracture results are not promising for isolated trochlear lesions with short term improvement of symptoms averaging 18 months [1, 5]. Studies on Mosaicplasty for trochlear lesions are not available but there are studies available for patellar lesions [1].

Autologous Chondrocyte implantation is a two-stage procedure and has 96% of good to an excellent outcome for focal cartilage defects. Only one study is available specifically for trochlear lesions with an overall improvement in outcome. However overall score did deteriorate between 2-7 years with 25% of patients requiring further procedure [6]. There is no published literature on the management of focal trochlear lesions with Osteochondral autograft transfer (OATS). There is no published evidence of treatment of trochlear lesions with Osteochondral allografts. However osteochondral allografts transfer in patellofemoral arthritis has shown favorable clinical and radiological outcomes [1, 7].

Rue et al [8] performed a study on anteriorisation of tibial tubercle on ten cadaveric knees and found to have a significant decrease in the patella-femoral contact pressures. Anteromedialisation in one of the studies showed good outcomes in the lateral trochlear lesion and poor outcomes in central lesions [9]. Patella femoral arthroplasty reports show good outcomes ranging between 45-90%. Although there is no consensus on the best modality of management, conservative and surgical options were discussed with the patient but, the patient chose to undergo patellofemoral replacement. With pristine patellar cartilage and isolated large trochlear lesion decision was made to only replace trochlea with a cobalt-chromium metal component.

The debate of resurfacing the patella in total knee replacement remains still uncertain. Foster's systematic review [10] suggested that the reoperation rate is slightly high in unresurfaced patella but there is uncertainty if resurfacing reduces anterior knee pain. It's well understood that cartilage preserving procedures must be favoured in young and active individuals, but ACI, OATS are not easily available in every hospital and comes with a huge cost. This novel method can be employed if any such hurdles arise. We understand with trochlear hemiarthroplasty, the patellar cartilage will eventually get delaminated, but with this conservative bone preserving approach, we will be left with the option of resurfacing the patella in the future and thereby increasing the longevity of the implants.

Conclusion

We recommend considering hemiarthroplasty in isolated trochlear lesions but with careful assessment of age, resources, patellofemoral alignment. Our patient did very well with the excellent outcome at seven years for both knees. Long term follow up will be a useful guide and will indeed be published in the future. Prospective cohort study randomised Controlled Trial would certainly be helpful to evaluate this technique further.

Conflict of interests None

Funding None

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