

Horizontal Inferior Patellar Dislocation in an Elderly Patient: A Case Report and Review of Literature

Ramy Shehata¹, Shuchi Kohli², Akshdeep Bawa¹, Sandeep Kohli³

¹Norfolk and Norwich University Hospital, Norfolk, UK

²Whiston Hospital, St Helens and Knowsley NHS Trust, Merseyside, UK

³Princess Royal University Hospital—Kings College NHS Trust, Orpington, UK

Email: Ramy.shehata@nhs.net, shuchikohli@sthk.nhs.uk, akshdeep.bawa@nhs.net, sandeepkohli@nhs.net

How to cite this paper: Shehata, R., Kohli, S., Bawa, A. and Kohli, S. (2023) Horizontal Inferior Patellar Dislocation in an Elderly Patient: A Case Report and Review of Literature. *Open Journal of Orthopedics*, 13, 224-232.

<https://doi.org/10.4236/ojo.2023.136023>

Received: February 7, 2023

Accepted: June 27, 2023

Published: June 30, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Intra-articular patellar dislocation due to acute trauma is considered a rare presentation and is less commonly encountered in practice than extra-articular patellar dislocation. This case study presents a rare type 2 inferior dislocation of the patella in an elderly patient which was successfully reduced and managed non-operatively.

Keywords

Patellar Dislocation, Elderly Patient, Horizontal Inferior Patella Dislocation

1. Introduction

Traumatic patellar dislocation can be classified based on the direction of dislocation into lateral, medial, and intra-articular [1]. Lateral patellar dislocation is the commonest type, while intra-articular dislocation is considerably uncommon. Intra-articular dislocations can be classified into superior, inferior, or vertical dislocations [2].

Type II inferior patellar dislocations occur due to an upward directed force on the lower patellar pole of a flexed knee, resulting in osteophytes at the upper patellar pole becoming impacted into the inter-condylar notch. These osteophytes then become entrapped into the femoral inter-condylar notch, resulting in inferior patellar dislocation [1].

Acute inferior patellar dislocation is also known as central or intra-articular dislocation. Midelfart reported the first case in 1887 and since then, only a few cases have been diagnosed or reported.

Inferior patellar dislocations presenting with a locked knee are uncommon in elderly patients and happen due to entrapped upper pole osteophytes.

In elderly patients with degenerative knee disease, reports recommended simple manipulation followed by a knee splint for a duration of three to four weeks [3] [4] [5] [6]. Syed and Ramesh *et al.* [7] recently reported this in an elderly patient who had an open operative procedure to prevent recurrence of locking. In 2010, Theodorides *et al.* [8] recommended performing open procedures in similar cases.

Our case demonstrates an uncommon type of inferior patellar dislocation with an intact extensor mechanism which was successfully reduced and managed non-operatively.

2. Case Presentation

A 92-year-old Caucasian woman was referred to our acute trauma unit following a simple trip off a step, landing on her left knee leading to a locked knee at a 70° angle. Before this fall, she was independently mobile with the use of a stick and lived alone with no carers. Co-morbidities included bilateral knee osteoarthritis, hypertension, and hypothyroidism. Examination of her left knee revealed a closed injury, mild knee swelling, and a skin dimple over the upper pole of the patella with locking and no mobility in the medio-lateral plane “**Figure 1**”. There were no clinical concerns regarding any other injuries. Full blood investigations were completed and were unremarkable. We noted a tender and inferiorly displaced patella. Her left knee had a range of motion between 70° to 120° with excruciating pain and a block to extension.

The initial Plain radiographs of her left knee revealed an inferior patellar dislocation with impaction of the upper pole patella into the femoral trochlea “**Figure 2**”.

Under sedation, the patellar dislocation was reduced, on the first attempt, by hyper-flexing the knee and placing infero-medial pressure on the lower pole of the patella, while slowly extending her knee up to hyperextension. Following this maneuver, the patella flipped laterally into a “dorsal fin patella” [9] which was easily reduced by knee hyperextension and flipping the patella inwards again. Immediately post-reduction, the pain was relieved and the normal knee contour was regained “**Figure 3**”. Her knee was then placed in a cricket pad splint and post-reduction X-rays were done which confirmed the reduction “**Figure 4**”.

Immediately post-reduction, the patient showed marked improvement in her symptoms. She was capable of straightening her leg without discomfort, signifying an intact extensor mechanism. She was also able to achieve full knee extension and was able to flex safely up to 95 degrees without pain or recurrence of dislocation. There was no palpable defect in the quadriceps or patellar tendon. Independent mobilization was possible without any locking, and her pre-injury mobility level was regained within 2 days. MRI scan, after the successful manipulation, was not required due to intact quadriceps function.



Figure 1. (a), (b) and (c): Clinical photographs taken at the time of injury showing skin dimpling and deformity.

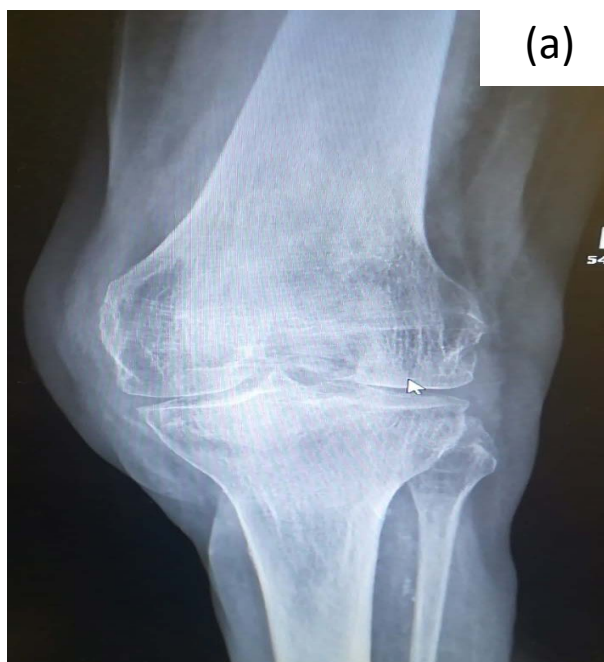


Figure 2. (a) Anteroposterior; (b) Lateral radiographs taken at the time of injury showing intra-articular patellar dislocation.

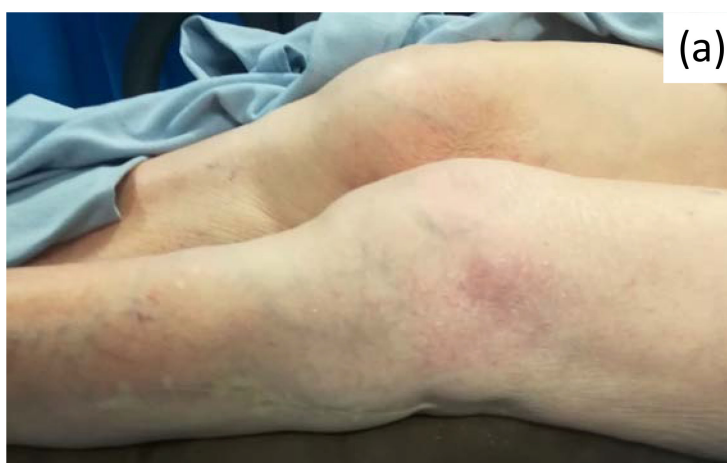




Figure 3. (a) and (b): Clinical photographs, taken immediately after the manipulation, showing resolution of flexion deformity and return of normal knee contour.



Figure 4. (a) Anteroposterior; (b) Lateral radiographs taken after manipulation confirming successful reduction of the patellar dislocation.

She was reviewed at the clinic 2 weeks later, it was noted that she was able to mobilize similar to her pre-injury level of mobility in terms of walking distance and not using any aids or knee braces. She was delighted and satisfied with the outcome. On review in clinic two months later, there was no change or deterioration in her mobility or pain and she was pleased with the outcome. Follow-up after 18 months revealed was satisfactory with no recurrence.

The knee injury and Osteoarthritis Outcome Score (KOOS) comprises seven questions about various activities that can be affected by knee injury/disease. Scoring ranges from 0% up to 100% representing knee health. A score of 0% denotes the worst knee health, and a score of 100% is the best possible knee health [10].

Our patient was asked to fill the KOOS four weeks after the closed reduction and her scores were as follows: Symptoms + Stiffness: 75%; Pain: 92%; Function, daily living: 84%; Function, sports and recreational activities: 50%; Quality of life: 63%. In addition, her Oxford Knee Score was 33, indicating mild to moderate knee arthritis.

3. Discussion

According to the Bankes and Eastwood classification, this case represents a Type II inferior patellar dislocation [3]. To our knowledge, only 64 similar case reports have been published ever since Midelfart *et al.* published the first case in 1887 [1] [2] [4] [6] [7] [8] [9] [11]-[28].

Inferior patellar dislocations were classified into two types by Bankes and Eastwood depending on the orientation of the articular surface of the patella and the presence of osteophytes [3]. Type I occurs when the flexed knee is subjected to a direct blow, forcing the upper pole of the patella into the femoral inter-condylar notch and detachment of the femoral insertion of the quadriceps tendon. Consequently, the patella is rotated horizontally so the articular surface faces inferiorly. This type is seen in young men. Type II occurs in elderly women and is caused by osteophytes. Unlike Type 1, superior pole osteophytes become entrapped into the inter-condylar notch, dislocating it inferiorly without detachment of the quadriceps tendon insertion and without horizontal rotation of the patellar articular surface. Based on the presence of osteophytes and the absence of horizontal rotational abnormality of the patella, our case can be classified as Type II [3].

Syed MA and Ramesh P have reported two mechanisms for type II inferior patellar dislocation [7]. In the first mechanism, osteophytes on the upper patellar pole become trapped and impacted into the inter-condylar notch, as a result of a direct blow directed upwards to the inferior pole of the patella when the knee is flexed, resulting in dislocation. In the second mechanism, patellar dislocation occurs without direct trauma. The muscle force of the quadriceps exerts upward traction on the patella with knee flexion, causing the osteophytes on the upper pole of the patella to become impacted and entrapped into the inter-condylar

notch thus resulting in a patellar dislocation. In the case reported here, the patient fell directly on her knee, suggesting that the first mechanism was involved [7].

Many reports described cases where a closed reduction was successful for this type of dislocation. Some authors reported that general anaesthesia was required or even essential for reduction [5] [11]. Others have stated that it could be performed without anaesthesia [12] or with the use of sedatives alone [3] [7] [11] [13]. Various reduction techniques have been reported, such as knee extension after flexion [14] or tibial traction to push the lower pole of the patella upward from below [11] and pressing downwards on the upper patellar pole while extending the knee [15].

No recurrence of dislocation was reported by Bankes and Eastwood [3], Joshi [5], and Garner *et al.* [11], after only manual reduction. However, Syed and Ramesh *et al.* [7] reported that recurrence could be prevented by resection of osteophytes. In addition, Barlow *et al.* reported a similar case of recurrent patellar dislocation due to upper patellar pole osteophyte impaction in the lateral femoral condyle, which was treated by osteophyte removal arthroscopically and femoral articular surface trimming [16].

There are several case reports in the literature regarding locked arthritic knees. Simple methods of manipulation and immobilization were recommended for the management of inferior patellar dislocations in elderly patients [14]. Current literature recommendations for recurrent and irreducible dislocations are open reduction and exploration; however, such procedures may lead to longer recovery duration [6] [8]. Irreducible and recurrent dislocations would thus benefit from arthroscopic procedures since they allowed a short duration of inpatient stay and a good immediate return to pre-injury mobility, within one week of surgery, with minimal soft tissue disruption [16].

Our case report aims to highlight that this rare condition can be associated with an intact quadriceps tendon and can be successfully managed by closed reduction under sedation. MRI scan or surgical intervention were not required in this case. There were no restrictions to weight bearing or mobility. Pre-injury functional levels were regained with no recurrence of dislocation at 18 months follow-up.

4. Conclusion

Locked knees due to this type of patellar dislocations are rare, extremely painful and require careful assessment, especially in the elderly. Successful closed reduction, as in this case, could be sufficient management without the need for open or arthroscopic reduction or MRI scan. However, careful and close monitoring for recurrence is required.

Funding Information

Consent for publication: Written informed consent was obtained from the patient for publishing this case report and any accompanying images. All authors

revised the manuscript and approved the version to be published.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Yoshioka, S., Arai, Y., Ikoma, K., Fujita, S., Akai, T., Sakuragi, R., *et al.* (2013) Two Cases of Inferior Dislocation of the Patella with Impaction into the Femoral Trochlea of Osteophytes on the Superior Pole of the Patella. *Case Reports in Orthopedics*, **2013**, Article ID: 691739. <https://doi.org/10.1155/2013/691739>
- [2] Uluyardımcı, E., Bozkurt, İ., Öçgüder, D.A. and Yalçın, N. (2019) Unusual Horizontal Patellar Dislocation Reduced without General Anesthesia: A Report of 2 Cases. *JBJS Case Connector*, **9**, e2. <https://doi.org/10.2106/JBJS.CC.18.00177>
- [3] Bankes, M.J. and Eastwood, D.M. (2002) Inferior Dislocation of the Patella in the Degenerate Knee. *Injury*, **33**, 528-529. [https://doi.org/10.1016/S0020-1383\(02\)00046-3](https://doi.org/10.1016/S0020-1383(02)00046-3)
- [4] Hersch, J., Watnik, N. and Marwin, S. (1999) Inferior Intra-Articular Dislocation of the Patella in an Elderly Patient. *American Journal of Knee Surgery*, **12**, 169-171.
- [5] Joshi, R.P. (1997) Inferior Dislocation of the Patella. *Injury*, **28**, 389-390. [https://doi.org/10.1016/S0020-1383\(97\)00033-8](https://doi.org/10.1016/S0020-1383(97)00033-8)
- [6] Nielsen, C.F., Fridén, T. and Ryd, L. (1993) Inferior Locking of the Patella: A Case Report. *The Journal of Trauma: Injury, Infection, and Critical Care*, **34**, 467-468. <https://doi.org/10.1097/00005373-199303000-00033>
- [7] Syed, M.A. and Ramesh, P. (2004) Recurrent Inferior Dislocation in an Osteo-Arthritic Knee. *Knee*, **11**, 141-142. [https://doi.org/10.1016/S0968-0160\(03\)00112-1](https://doi.org/10.1016/S0968-0160(03)00112-1)
- [8] Theodorides, A., Guo, S. and Case, R. (2010) Intra-Articular Dislocation of the Patella: A Case Report and Review of the Literature. *Injury Extra*, **41**, 103-105. <https://doi.org/10.1016/j.injury.2010.06.006>
- [9] Gamble, D., Otto, Q., Carrothers, A. and Khanduja, V. (2015) Patella Dislocation with Vertical Axis Rotation: The “Dorsal Fin” Patella. *Case Reports in Orthopedics*, **2015**, Article ID: 328386. <https://doi.org/10.1155/2015/328386>
- [10] Roos, E.M. and Toksvig-Larsen, S. (2003) Knee Injury and Osteoarthritis Outcome Score (KOOS)—Validation and Comparison to the WOMAC in Total Knee Replacement. *Health and Quality of Life Outcomes*, **1**, Article No. 17. <https://doi.org/10.1186/1477-7525-1-17>
- [11] Garner, J.P., Pike, J.M. and George, C.D. (1999) Intra-Articular Dislocation of the Patella: Two Cases and Literature Review. *Journal of Trauma*, **47**, 780-783. <https://doi.org/10.1097/00005373-199910000-00030>
- [12] Choudhary, R.K. and Tice, J.W. (2004) Intra-Articular Dislocation of the Patella with Incomplete Rotation—Two Case Reports and a Review of the Literature. *Knee*, **11**, 125-127. [https://doi.org/10.1016/S0968-0160\(03\)00042-5](https://doi.org/10.1016/S0968-0160(03)00042-5)
- [13] Wight, L. and James, D. (2017) Intra-Articular Patellar Dislocation: A Technique for Closed Reduction: A Case Report and Review of the Literature. *JBJS Case Connect*, **7**, e94. <https://doi.org/10.2106/JBJS.CC.17.00112>
- [14] Yuguero, M., Gonzalez, J.A., Carma, A. and Huquet, J. (2003) Intra-Articular Pa-

- tellar Dislocation. *Orthopedics*, **26**, 517-518.
<https://doi.org/10.3928/0147-7447-20030501-21>
- [15] McCarthy, T.A., Quinn, B. and Pegum, J.M. (2001) Inferior Dislocation of the Patella: An Unusual Cause of a Locked Knee. *Irish Journal of Medical Science*, **170**, 209-210. <https://doi.org/10.1007/BF03173896>
- [16] Barlow, D., Foong, K.S., Rhee, S.J., Sutcliffe, W. and Griffin, S.J. (2011) Recurrent Locked Knee Caused by an Impaction Fracture Following Inferior Patellar Dislocation: A Case Report. *Journal of Medical Case Reports*, **5**, Article No. 347.
<https://doi.org/10.1186/1752-1947-5-347>
- [17] Gidden, D.J. and Bell, K.M. (1995) An Unusual Case of Irreducible Intra-Articular Patellar Dislocation with Vertical Axis Rotation. *Injury*, **26**, 643-644.
[https://doi.org/10.1016/0020-1383\(95\)00124-R](https://doi.org/10.1016/0020-1383(95)00124-R)
- [18] Mir, N.A., Kawoosa, A.A. and Mir, G.R. (2002) Intercondylar Locked Dislocation of Patella with Vertical Axis Rotation: A Simple Method of Closed Reduction. *JK Practitioner*, **9**, 223-226.
- [19] Colville, J. (1977) An Unusual Case of Intra-Articular Dislocation of the Patella. *Injury*, **9**, 321-322. [https://doi.org/10.1016/S0020-1383\(77\)80054-5](https://doi.org/10.1016/S0020-1383(77)80054-5)
- [20] Pagdal, S., Lande, O. and Jadhav, U. (2016) Intra-Articular Dislocation of Patella Reduced by Closed Method—A Rare Case Report. *Journal of Clinical Orthopaedics and Trauma*, **7**, 118-120. <https://doi.org/10.1016/j.jcot.2016.03.002>
- [21] Chauhab, A., Maheswaran, S. and Anand, S. (2014) Horizontal Intraarticular Dislocation of Patella—A Case Report and Review of Literature. *Injury Extra*, **45**, 80-82.
<https://doi.org/10.1016/j.injury.2014.07.008>
- [22] Awan, S., Parfitt, A., Selvakumar, P. and Reid, P. (1999) An Unusual Case of Patella Dislocation. *Journal of Accident & Emergency Medicine*, **16**, 301-303.
<https://doi.org/10.1136/emj.16.4.301>
- [23] Frangakis, E.K. (1974) Intra-Articular Dislocation of the Patella: A Case Report. *The Journal of Bone & Joint Surgery*, **56**, 423-424.
<https://doi.org/10.2106/00004623-197456020-00025>
- [24] van den Broek, T.A.A. and Moll, P.J. (1985) Horizontal Rotation of the Patella: A Case Report with Review of the Literature. *Acta Orthopaedica Scandinavica*, **56**, 436-438. <https://doi.org/10.3109/17453678508994367>
- [25] McHugh, G., Ryan, E., Cleary, M., et al. (2013) Intra-Articular Dislocation of the Patella. *Case Reports in Orthopedics*, **2013**, Article ID: 535803.
<https://doi.org/10.1155/2013/535803>
- [26] Newman, D. and Rutherford, H. (1901) Glasgow Royal Infirmary: Two Cases of Dislocation of the Patella, One Upwards and One Downwards. *The Lancet*, **157**, 1761-1762. [https://doi.org/10.1016/S0140-6736\(01\)82421-1](https://doi.org/10.1016/S0140-6736(01)82421-1)
- [27] Berenger, V., Pesenti, S., Ollivier, M., Buord, J.-M. and Pinelli, P.-O. (2013) Traumatic Inter-Condylar Dislocation of the Patella: Report of Two Cases. *Orthopaedics & Traumatology: Surgery & Research*, **99**, 979-981.
<https://doi.org/10.1016/j.otsr.2013.07.016>
- [28] Despotidis, V., Weihs, J., Joseph, Z. and Gousopoulos, L. (2020) Intra-Articular Horizontal Dislocation of the Patella: A Rare Injury and Review of the Literature. *BMJ Case Reports*, **13**, e232249. <https://doi.org/10.1136/bcr-2019-232249>