**Supplementary Table 1.** The advantages and shortcomings of ORIF and arthroscopic surgery

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| **Surgical method** | **Advantages** | **Shortcomings** |
| **ORIF** | 1. Suitable for fixing larger bone fragments.  2. Provide direct visual and tactile feedback for easy operation. | 1.For smaller, thinner, or comminuted fractures, hollow nails do not have an advantage.  2. Hollow nails have a large diameter, which may cause bone fracture during drilling and screwing.  3.During the nail placement process, it is necessary to repeatedly confirm the position of the guide pin and hollow nail through fluoroscopy.  4.Hollow nails occupy a large space and can cause significant bone loss.  5. Affects the range of motion of the knee joint.  6.During open reduction and internal fixation surgery, repeated C-arm fluoroscopy is required to increase the risk of incision infection and radiation hazards. |
| **Arthroscopic surgery** | 1. The surgical incision is small, effectively preventing nerve and vascular damage, and the patient recovers quickly after surgery.  2. The application of a dual posterior medial approach ensures accurate operation and avoids fracture fragmentation caused by hollow nails, making fracture fixation reliable.  3. Arthroscopy can simultaneously explore and treat intra-articular injuries such as meniscus and cartilage injuries to avoid missed diagnosis.  4. It is beneficial for reducing postoperative infections and soft tissue scar formation.  5. Suitable for comminuted fractures and fractures with small bone fragments.  6. Simplify surgery and reduce surgical injuries.  7. Reduce the economic burden and pain of secondary surgery for patients.  8. Reduce the health damage caused by radiation to patients and medical staff, and reduce the risk of intraoperative infection. | 1. For larger bone fragments, ORIF may not be as stable.  2. High technical proficiency is required.  3. Direct visual and tactile feedback in certain situations may not be as intuitive. |

Abbreviations: ORIF, open reduction and internal fixation