ABSTRACT

Introduction: Due to an increase in traffic accidents and more common people participating in sports-related activities, knee injuries are more frequent today. The knee’s anterior cruciate ligament is the ligament that gets injured the most frequently. The principal stabiliser that prevents the anterior translation of the tibia over the femur is the anterior cruciate ligament, which plays a pivotal role in the stability and function of the knee joint. The gold standard for treating these injuries is arthroscopic anterior cruciate ligament reconstruction. Methods: This study is a retrospective and prospective analysis of 60 patients who underwent arthroscopic reconstruction of the anterior cruciate ligament using a quadrupled hamstring graft with an endobutton as the femoral fixation device and a titanium interference screw (no=30) or a bioabsorbable interference screw (no=30) as the tibial fixation device. Results: This study is a retrospective and prospective analysis of 60 patients who underwent arthroscopic reconstruction of the anterior cruciate ligament using a quadrupled hamstring graft with an endobutton as the femoral fixation device and a titanium interference screw (no=30) or a bioabsorbable interference screw (no=30) as the tibial fixation device. Conclusion: Clinical outcomes for interference screws made of titanium and bioabsorbable material are statistically comparable. The two screws’ complication rates were comparable as well. This comparison analysis’s findings are consistent with the claim that titanium screws and bioabsorbable screws both produce comparable results when used for ACL restoration.

KEYWORDS Anterior cruciate ligament, quadrupled hamstring graft, titanium, bioabsorbable, interference screw, endobutton, arthroscopy.
have made ACL reconstruction with an arthroscopic aided approach the preferred course of treatment (5). Arthroscopy is superior to open surgery and is preferred because it reduces post-operative swelling and allows for an early full range of motion.

More soft tissue grafts are being used today than bone patellar tendon bone transplants. During ACL reconstruction, either metal or biodegradable screws can be used to fix the graft. Utilizing bioabsorbable screws improves visibility in postoperative MRIs and prevents removal at a later time. On the other hand, the optimum graft, the ideal fixation method, and the ideal reconstructive approach remain controversial.

Although it is intra-articular, the anterior cruciate ligament is a powerful extra synovial ligament. It has a multi-fascicular structure that extends from the medial face of the lateral femoral condyle to the posterior and lateral portions of the anterior part of the tibia. The ligament has a cross-section of 31.3 mm² and is 31 to 35 mm in length.

Methods

The 60 patients who underwent arthroscopic anterior cruciate ligament reconstruction using a quadrupled hamstring graft with an endobutton as the femoral fixation device and a titanium interference screw (no=30) or a bioabsorbable interference screw (no=30) as the tibial fixation device between one year at Kalinga Institute of Medical Sciences, Bhubaneshwar were studied.

Inclusion and exclusion criteria

Patients with closed growth plate, primary ACL surgery, no evidence of multiple ligament injuries, no previous knee surgeries, and no ligamentous injury to the contralateral knee were included in this study. However, those patients who had previously undergone ACL surgery of either knee had any co-existing local conditions in the form of -Active articular infection - Inflammatory joint disease, any additional ligamentous laxity in the affected knee, chronic muscle disorders, metabolic bone disease or neoplastic disease, were excluded.

Results

60 arthroscopy-aided cases Anterior cruciate ligament reconstruction utilising a quadrupled hamstring tendon graft was monitored for 6 months to 1.5 years. The femoral fixation device was an endobutton. The tibial fixation device was either a titanium interference screw (no=30) or a bioabsorbable interference screw (no=30). A 10.5-month follow-up was the average. The average age was 31.6 years, with a minimum age of 20 and a maximum age of 55 (Table 1).

We saw most of our patients in the younger age bracket of 21–25 years. In our survey, there was a predominance of men. Left side involvement was less common than on the right. The most frequent reason for ACL injury was a car accident. More damage to the medial meniscus than the lateral meniscus was present (Table 2). At 4 months, the majority of patients were back to their pre-functional state.

Discussion

Due to an increase in sports participation and traffic accidents during the past ten years, there has been a significant rise in the incidence of anterior cruciate ligament reconstruction (6). Knee instability problems that occur repeatedly call for surgical intervention. In the modern era, arthroscopic ACL reconstruction has replaced open surgery as the gold standard.

Even though arthroscopic reconstruction has become common, there is ongoing disagreement about the best type of graft to use, how to fixate it, and whether to reconstruct transtibial...
### Table 1 Distribution of age and sex

<table>
<thead>
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<th>Age</th>
<th>Patients</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>15-20</td>
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<td>6.67</td>
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<tr>
<td>21-25</td>
<td>15</td>
<td>25</td>
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<tr>
<td>26-30</td>
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<td>31-35</td>
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<table>
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<th>Sex</th>
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### Table 2 Duration of injury and associated injury

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<td>6-3 months</td>
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<td>3-6 months</td>
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<td>25</td>
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<td>6-12 months</td>
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<td>21.67</td>
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<td>&gt;12 months</td>
<td>9</td>
<td>15</td>
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<tr>
<td>Total</td>
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<table>
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<tr>
<th>Associated injury</th>
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<td>Lateral meniscus tear</td>
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<td>Medial meniscus tear</td>
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<td>Nil</td>
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<td>68.33</td>
</tr>
<tr>
<td>Both</td>
<td>3</td>
<td>5</td>
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</table>
Young Ho Oh demonstrated that a hybrid fixation in the femoral
physical therapy regimen that strongly emphasises quadriceps
pull-outs or graft attachment site failures occurred in our inves-
patients as a tibial fixation device.

Past ten years, and numerous academic studies on the methods
grades. According to J A Grant’s (15) analysis, home-based physi-
strength and knee flexion, with a mean flexion reached 135 de-
cise can improve results. Our patients are put on a home-based
knee pain. In 2005, Kurt Spindler (14) claimed that regular exer-
the 13 percent occurrence in our study, Fox et al. (12) and Apos-
to remark on the post-operative arthritic changes. As opposed to
interference screws for anterior cruciate ligament restoration.

Interference screws over conventional titanium interference screws. As a
eemoral fixation device and a titanium interference screw, re-
respectively, we used endobuttons. A recent study found that
tunnel widening was more common with interference screws
than endobuttons and attributed tunnel widening to biological
factors rather than mechanical ones of the fixation device, de-
spite concerns about the bungee effect of the graft while using
endobutton causing movement of the graft in the tunnel, widen-
ing of the tunnel, and interference to graft incorporation. No
pull-outs or graft attachment site failures occurred in our inves-
tigation, and the endobutton was able to sustain postoperative
rehabilitation.

With a P value of 0.97, our study’s functional result evaluation
using Lysholm and Gillquist scoring found that the titanium in-
terference screw study group and the bioabsorbable interference screw study group had substantially identical functional out-
comes. According to our research, there are no appreciable dif-
fences between the results of using titanium and bioabsorbable interference screws for anterior cruciate ligament restoration.

Since our study was a short-term follow-up, we were unable
to remark on the post-operative arthritic changes. As opposed to
the 13 percent occurrence in our study, Fox et al. (12) and Apos-
tolopoulos (13) reported a 3 to 17 percent incidence of anterior
knee pain. In 2005, Kurt Spindler (14) claimed that regular exer-
cise can improve results. Our patients are put on a home-based
physical therapy regimen that strongly emphasises quadriceps
strength and knee flexion, with a mean flexion reached 135 de-
grees. According to J A Grant’s (15) analysis, home-based physi-

References

1. Butler DL, Noyes FR, Grood ES – Ligamentous restraints to
anterior-posterior drawer in human knee. A biomechanical

2. Haimes JL, Wroble RR, Grood ES, Noyes FR – Role of me-
dial structures in the intact and anterior cruciate ligament
deficient knee. Limits of motion in the human knee. Am J

3. Satku K, Kumar VP, Ngoi SS – ACL injuries. To counsel or


5. Fu FH, Bennett CH, Ma CB – Current trends in anterior cruciate ligament reconstruction: Operative procedures and

6. Rubinstein RAJ, Shelbourne KD. Graft selection, placement,
f ixation and tensioning for Anterior cruciate ligament re-

7. Reconstruction Using Biodegradable Interference Fit Fixa-
tion A Prospective Matched- Group Analysis Am J Sports


9. Petteri Kousa,‡ MD, Teppo L. N. Jaˇrvinen,‡§ MD, PhD, Mika Vihavainen,‡ Pekka Kannus,‡ MD, PhD, and Markku
Jaˇrvinen,‡ MD, PhD The Fixation Strength of Six Ham-
string Tendon Graft Fixation Devices in Anterior Cruciate Ligament Reconstruction.


