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How Successful Are Meniscus Repair All-Inside Implants During Deployment?



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Disclosures

Consultant

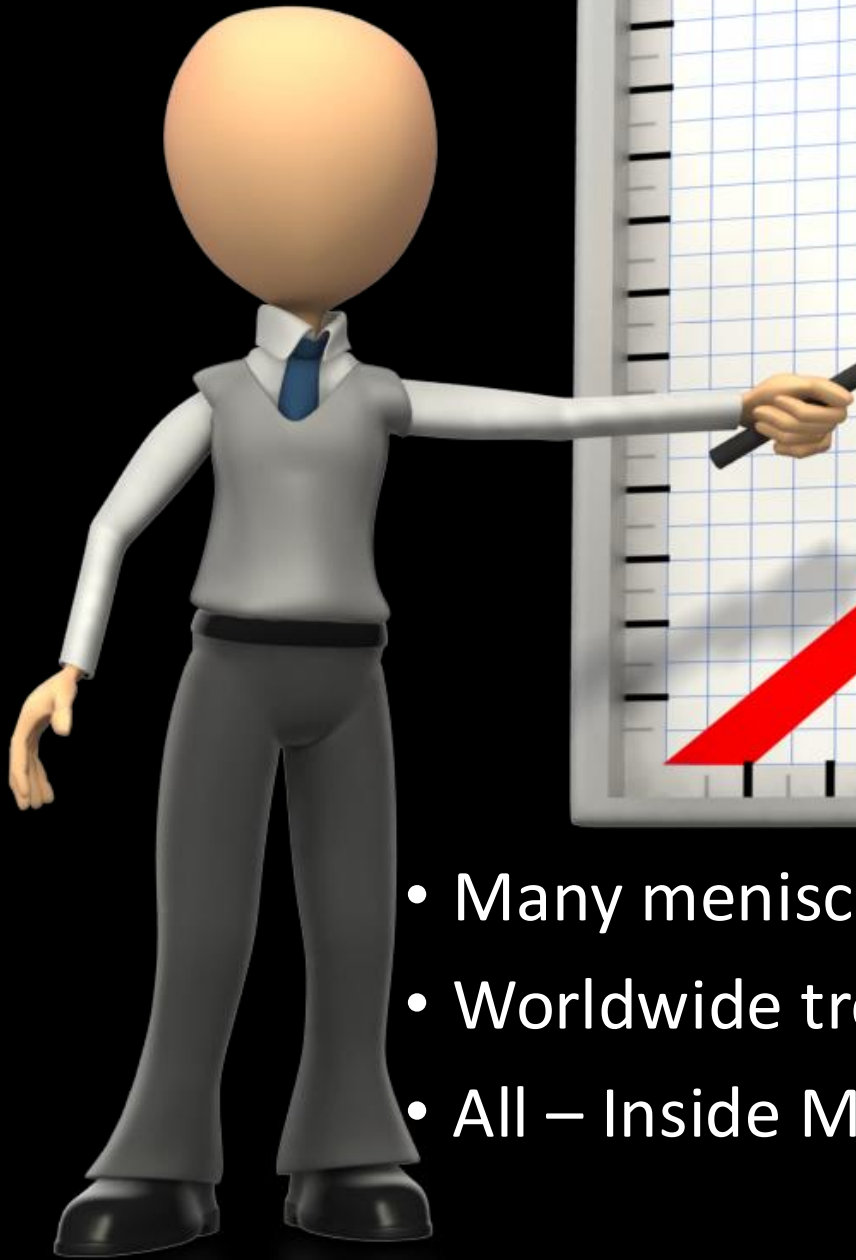
- Conmed – MTF
- SBM
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- Hyalex
- Vericel
- Anika
- Nanochon

Research Support

- Tissue Tech
- MTF
- Smith & Nephew
- Conmed
- Aesculap
- Moximed
- J&J Sports
- Vericel
- ZKR Orthopedics

Committees

- AOSSM Fellowship
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Meniscus Repairs Becoming More Common

- Many meniscus tear types are now repairable
- Worldwide trends for meniscus repairs are rising
- All – Inside Meniscus Repairs with implants predominant technique

Meniscus Repairs are Cost Effective

Isolated MR

MR with ACLR

Root MR

Improved long term outcomes

Cost savings in QALY

Rogers et al, Arthroscopy 2019
Faucett et al, AJSM 2018
Feeley et al, Knee, 2016
Lester et al, Arthroscopy 2018

A Cost-Effectiveness Analysis of Isolated Meniscal Repair Versus Partial Meniscectomy for Red-Red Zone, Vertical Meniscal Tears in the Young Adult

Mark Rogers, M.D., Scott Dart, M.D., Susan Odum, Ph.D., and James Fleischli, M.D.

Meniscus Root Repair vs Meniscectomy (CM) or Nonoperative Management to Prevent Knee Osteoarthritis After Medial Meniscus Root Tears

Clinical and Economic Effectiveness

Scott Faucett, MD, MS, Benjamin Peter Geisler, MD, MPH, Charles S. MD, PhD, Aaron J. Krych, MD, Peter J. Kuwajiri, MD, Abigail M. Garner, MD, Shan Liu, MD, Robert F. LaPrade, MD, PhD, and Jan B. Pietzsch, PhD

The cost-effectiveness of meniscal repair versus partial meniscectomy: A model-based projection for the United States

Brian T. Feeley^{a,*}, Shan Liu^{b,c}, Abigail M. Garner^b, Alan L. Zhang^a, Jan B. Pietzsch^{b,d}

The Cost-Effectiveness of Meniscal Repair Versus Partial Meniscectomy in the Setting of Anterior Cruciate Ligament Reconstruction

Jonathan D. Lester, M.D., Jacob D. Gorbaty, M.D., Susan M. Odum, Ph.D., Mark E. Rogers, M.D., and James E. Fleischli, M.D.

But What Drives the Cost of Surgery?

All inside repairs are as successful as inside out repairs

- Have become more popular
- Easy, fast, less complications

In ACL surgery

- Graft choice and meniscus repair increase cost of surgery
- Meniscus repair was the major driver in cost of surgery
- All –Inside implants predominately used

Multiple all inside implants available

- Current market \$458.1 million in US alone

Many repairs require multiple sutures/implants to provide adequate repair

Vint et al, the Knee, 2021

Pan et al, Cureus 2023

Grand View Research Report ID: GVR-4-68040-030-8



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Purpose

- To determine the percentage of implants successfully deployed during arthroscopic all-inside repair

Methods

- A data query of meniscus repair (CPT codes: 29882 and 29883) procedures was performed at a single institution
- 5 sports medicine fellowship trained orthopaedic surgeons
- Procedures were performed between June 1, 2020 and June 1, 2023.
- Multiple different manufacturer implants utilized



Data Mining in Epic EMR System

- For every all – inside meniscus repair cases implant usage documented
 - # of implants successfully used
 - #of implants wasted due to intra-operative failure
- Success rate of meniscal implants was determined by dividing the number of implants wasted by the total amount of implants used.

Results



- The query identified 1026 patients that underwent meniscus repair
- From this cohort, 3,867 total meniscal implants for an average of 3.77 implants per case
- Implant failure or waste rate was found 1.03% (n=40)

Were there Differences in Implant Used?

| Meniscus Implant | Number Implants Used | Number Implants Wasted/Failed | % Wasted/Failed Implantation |
|----------------------------|----------------------|-------------------------------|------------------------------|
| Air Meniscus Repair System | 121 | 2 | 1.65 |
| FastFix 360 | 134 | 2 | 1.49 |
| FastFix Flex | 1280 | 10 | 0.78 |
| Fiberstitch | 159 | 0 | 0 |
| Juggerstitch | 32 | 3 | 9.37 |
| Novostitch 2-0 | 1615 | 13 | 0.84 |
| Novostitch 0 | 247 | 6 | 2.43 |
| Infinity Aim | 6 | 0 | 0 |
| Scorpion | 7 | 0 | 0 |
| SoftStitch | 1 | 0 | 0 |
| SuperBall | 54 | 0 | 0 |
| Truspan | 211 | 4 | 1.9 |

The highest failure rates

JuggerStitch (9.37%)

NOVOSTITCH 0 Suture (2.43%)

TRUESPAN (1.9%)

Limitations

- Data extracted from EPIC is only as good as the data input
 - Many implants in system had multiple entry identifiers
 - Circulating nurse responsible for recording implants implanted and removed/failed implantation (non successful implants)
- Follow up QI project identified lack of noting implants that failed or removed in system



Conclusions

1

Meniscus Implant failure rate was found to be low

2

Some implants were found to have higher failure rates

3

Data input errors were identified preventing useful conclusions to be drawn



Future Research Needed

- Implant cost (regardless of success of implantation) is burden of patient/insurance company/health care system
- Implants with lower success rates of implantation require industry improvement or surgical training

References

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Thank You
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