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First-in-human study for the 'FibroFix Cartilage P™' knee implant

Submission date
28/10/2022

Recruitment status
Stopped

Registration date
01/11/2022

Overall study status
Stopped

Last Edited
16/09/2024

Condition category
Musculoskeletal Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Damage to knee cartilage is a common and important source of knee pain and knee problems. It can be caused by a sudden injury, such as a sports injury, or gradual wear and tear. Cartilage lesions do not heal on their own because cartilage does not have a good blood supply. If the damage is left untreated, it can eventually wear down the joint and require a knee replacement. FibroFix™ Cartilage P is a new implant, designed to replace damaged cartilage tissue and to promote cartilage healing. The FibroFix™ Cartilage P Drill Set consists of instruments designed to create an accurate site for implantation of FibroFix™ Cartilage P implant. The aim of the study is to evaluate the safety and performance of FibroFix™ Cartilage P implant and the instruments used to implant it for the repair of damaged areas of cartilage in the knee joint.
The implant and instrument set have been strictly and appropriately tested according to the Medicines and Healthcare products Regulatory Agency's (MHRA) standards. This study will be the first time that FibroFix™ Cartilage P has been implanted in humans. 75 participants will be recruited in this two-stage research study conducted in the United Kingdom and Europe: in Stage 1, the researchers will recruit 6 people and we will review the safety and performance data for those participants; then, in Stage 2, they will recruit the remaining 69 people and we will complete the review of the study data for all participants. The total duration of the research study is expected to be 12 years to complete with each participant involved for 10 years (2 years of follow-up hospital visits, then a further 8 years of remote follow-up).

Who can participate?
Patients between the ages of 18 and 65 years who have a symptomatic cartilage lesion (causing pain, discomfort, and/or affecting daily activities) in the correct place (femoral condyles) and of the appropriate size (maximum 26.6 mm length x 20.0 mm width) for treatment using this implant

What does the study involve?
Before surgery, participants will attend a pre-surgery assessment clinic visit to collect their demographic and medical history and information regarding their normal daily activities, the pain or discomfort they feel, and other details about their knee problems. An MRI scan of the affected knee will be required (if not already available). Participants will undergo a standard knee surgery procedure. Any unstable cartilage will be removed and the edges of the damaged

area will be made smooth and stable. If the size of the lesion meets the study inclusion criteria, the participant will be included in the study. The surgeon will use the instrument set to create an appropriate site for the implant. Once created, the matching implant will be inserted into the site. The surgical procedure will then be completed as standard. If the size of the lesion does not meet the study inclusion criteria, the participant is not suitable for this treatment and will not be included in the study. The surgeon will treat them with the hospital's standard care. The surgeon will decide the best rehabilitation plan according to standard care for patients undergoing treatment for symptomatic lesions in the knee of the type being included in this study, and participants will see a physiotherapist during their rehabilitation. After surgery, participants will be asked to return for follow-up appointments at 2 weeks, 6 weeks, 3 months, 6 months, 1 year and 2 years. They will have clinical and questionnaire-based assessments performed at each follow-up visit and will undergo further MRI scans at 3 months, 6 months, 1 year, and 2 years after the surgery. For each of the 8 years that follow, participants will be asked to complete a questionnaire and report any adverse events that could be related to the surgery they had on their knee. The pre-operative assessment appointments, surgery, and follow-up visits for the first 2 years after surgery will be performed at the hospital where the participants had their surgery or at the surgeon's offices which may be located elsewhere. For the follow-up in years 3-10 after your surgery, they will not need to go to the hospital and will be contacted by post, email, or telephone.

What are the possible benefits and risks of participating?
There is no guarantee that participation in this study will offer any benefit. Laboratory studies have suggested that FibroFix™ Cartilage P treatment can have benefits, but it is not known whether it will provide benefits over standard treatment or not. It is hoped that the results of this study could help to improve recovery and the recovery of people with similar problems. Participants will be the first patients in the world to receive this implant. A disadvantage is the time it takes to participate since completion of the questionnaires and attendance of follow-up appointments will take time, and that very few, if any other patients have had this procedure before.
The potential benefits of participation include the return to normal, healthy cartilage-like tissue in the knee joint. Participants are expected to return to normal activities quickly after surgery with a short rehabilitation time. If the normal function of the cartilage can be restored, it is anticipated that any pain present in the knee may decrease and the chances of developing osteoarthritis in the knee over time may also decrease. The need for knee replacement surgery may also be delayed. Another benefit is that recovery and healing will be closely monitored for 2 years after surgery to check whether the treatment has been effective.
Potential risks:
1. Incorrect placement or fixation of the cartilage implant
2. Fragmentation or dislocation of the implant
3. Allergic, or other reaction to the implant if you are allergic to silk
4. Contamination of the implant at the time of surgery
5. Failure of the tissue to grow into the implant
6. Risks common to those undergoing standard treatment (e.g., pain, infection, stiffness, swelling, scar, numbness, injury to blood vessels and nerves).
7. Unforeseen risks that may require medical or surgical treatment to correct
There is no established risk associated with the implant and pregnancy. The theoretical risk of maternal or neonatal harm is extremely low, but since this is a new product implanted for the first time in humans, it is not appropriate to participate if you are pregnant or planning to become pregnant within 6 months of surgery.

Where is the study run from?
University of Bristol (UK)

When is the study starting and how long is it expected to run for?
September 2020 to August 2034

Who is funding the study?
Orthox Ltd (UK)

Who is the main contact?
Rosalyn Archer, rosalyn@archerclinical.co.uk

Contact information

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Principal investigator

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Additional identifiers

ClinicalTrials.gov (NCT)
NCT05560490

Integrated Research Application System (IRAS)
295616

Central Portfolio Management System (CPMS)
49466

Protocol serial number
CIP ORTH A001

Study information

Scientific Title
Safety and performance of FibroFix™ Cartilage P Implant and Drill Set for articular cartilage repair within the knee joint

Acronym
FFLEX

Study objectives
This is a multi-center first-in-human prospective clinical investigation to evaluate the safety and performance of the FibroFix™ Cartilage P Implant and Drill Set.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 21/06/2022, West Midlands - Edgbaston Research Ethics Committee (3rd Floor, Barlow House, Minshull Street, Manchester, M1 3DZ, UK; +44 (0) 207 104 8070; edgbaston.rec@hra.nhs.uk), ref: 21/WM/0280

Primary study design
Interventional

Study design

Multi-center first-in-human prospective clinical investigation

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Repair of articular cartilage lesion in the knee

Interventions
The FibroFix Cartilage P instrument set (Drill set) is used for the preparation of an implant site and placement of the FibroFix Cartilage P Implant to resurface an articular cartilage lesion in the anterior and central regions of the femoral condyles of the knee.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Incidence, nature, and severity of the procedure and/or device-related adverse events at 3- and 6-month post-surgery follow-up
2. Knee functionality measured using KOOS Pain and Function (Sport/Rec) score at baseline and 1-year post-surgery follow-up

Key secondary outcome(s)
1. Knee functionality is measured using the Knee injury and Osteoarthritis Outcome Score (KOOS) questionnaire at baseline, then post-surgery after 2 weeks, 6 weeks, 3 months, 6 months, 1 year, 2 years, 3 years, 4 years, 5 years, 6 years, 7 years, 8 years, 9 years and 10 years
2. Pain is measured using the visual analogue score (VAS) at baseline, then post-surgery after 2 weeks, 6 weeks, 3 months, 6 months, 1 year and 2 years
3. Function and activity are assessed using the Lysholm score and Tegner Activity questionnaires at baseline, then post-surgery after 2 weeks, 6 weeks, 3 months, 6 months, 1 year and 2 years
4. Quality of life is measured using the EuroQol 5-Dimension (EQ-5D) questionnaire at baseline, then post-surgery after 3 months, 6 months, 1 year and 2 years
5. Usability is measured by a questionnaire completed by staff and patients after surgery
6. Performance and medical condition of the device are assessed by magnetic resonance imaging (MRI) at baseline (unless an image is already available), then post-surgery after 3 months, 6 months, 1 year and 2 years
7. Adverse events are assessed by the medical staff recording any unusual medical events occurring that are device or surgery-related, during surgery and the patient will be asked to report any adverse events post-surgery which may be related to the device or the procedure, at 2 weeks, 6 weeks, 3 months, 6 months, 1 year, 2 years, 3 years, 4 years, 5 years, 6 years, 7 years, 8 years, 9 years and 10 years

Completion date
31/08/2034

Reason abandoned (if study stopped)
Objectives no longer viable

Eligibility

Key inclusion criteria
1. Patient is able to provide written informed consent
2. Age ≥18 years at the time of enrolment
3. Able to comply with the protocol-defined pre-operative procedures, the post-operative clinical and imaging evaluations, and the recommended rehabilitation regimen as determined by the Investigator
4. Has a joint surface lesion, International Cartilage Repair Society (ICRS) Grade 3 or above, on femoral condyles
5. Female subjects of child-bearing potential: a negative urine pregnancy test at the time of enrolment
6. Patient has been diagnosed by MRI or other imaging technique to confirm the presence of a cartilage lesion and the lesion remains symptomatic. Only patients for whom the decision to perform the surgery has already been made will be invited to participate. Asymptomatic lesions will NOT be included.

Intra-operative inclusion criterion:
7. Lesion area of less than 26.6 mm in height and less than 20.0 mm in width in the index knee after debridement

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Total final enrolment
2

Key exclusion criteria
1. Age >65 years or <18 years at the time of enrolment
2. Body mass index (BMI) >35 kg/m²
3. Lesion area of more than 26.6 mm length and more than 20.0 mm width in the index knee after debridement
4. Patient has multiple lesions to be treated
5. Articular cartilage lesions in the tibia or patella, ICRS grades 3 and above
6. KOOS Pain Subscale score at baseline that is <20 or >65 (scale range: maximum pain = 0, pain free = 100)
7. Patient has previously received the FibroFix™ Cartilage P implant
8. Patient suffers from any medical condition that would hinder cartilage repair, such as additional unresolved comorbidities related to the index knee
8.1. Clinically significant untreated ligament instability of the same knee
8.2. Patient is post-op from surgery on the same knee within 6 months which stipulates ongoing

rehabilitation
8.3. Untreated, symptomatic, unstable meniscal lesions on patients with residual meniscus volume of <50% in the same compartment
8.4. Joint malalignment that in the opinion of the treating surgeon, requires osteotomy to correct
8.5. Any previous surgical cartilage treatment in the index knee within the previous 6 months
8.6. Evidence of osteonecrosis of the involved knee
9. A known allergy to:
9.1. General and/or regional anaesthetic
9.2.. Silk or silk-containing products, or
9.3. Glycerol or products containing glycerol
10. Demonstrating an active local or systemic infection
11. Any condition, which in the judgment of the Investigator would preclude adequate evaluation of the FibroFix™ Cartilage P implant and clinical outcome
12. A history of confirmed anaphylactoid reaction
13. Has received local administration of any type of corticosteroid or systemic administration of antineoplastic, immunostimulating, or immunosuppressive agents within 180 days prior to the scheduled surgery
14. Medical history that includes a confirmed diagnosis of rheumatoid or inflammatory arthritis, or relapsing polychondritis
15. If female and of child-bearing potential: evidence of a positive pregnancy test or a stated intention to become pregnant in the next 6 months at the time of enrolment
16. Currently participating in another device or drug clinical investigation or has done so in the previous 3 months which would impact the results of the surgery in the opinion of the surgeon or be a barrier to participation

Date of first enrolment
01/09/2022

Date of final enrolment
31/08/2024

Locations

Countries of recruitment
United Kingdom

England

Hungary

Study participating centre
North Bristol NHS Trust
Southmead Hospital
Southmead Road
Westbury-on-trym
Bristol
United Kingdom
BS10 5NB

Study participating centre
Menta Egészségközpont
Brassai Sámuel 16
Budapest
Hungary
1126

Sponsor information

Organisation
Orthox (United Kingdom)

ROR
https://ror.org/032h5dn41

Funder(s)

Funder type
Industry

Funder Name
Orthox Ltd

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analyzed during the current study will be published as a supplement to the publication of the results.

IPD sharing plan summary
Published as a supplement to the results publication

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Funder report results		13/09/2024	16/09/2024	No	No
HRA research summary			26/07/2023	No	No