Role of integrated approach of yoga therapy in a failed post-total knee replacement of bilateral knees

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ABSTRACT
OA Knee is the most common arthritis. Knee replacement surgeries are being done increasingly in the present times. This has led to the violation of the standard indications and when knees are replaced ignoring other co-muscloskeletal conditions it results in the surgery failing early. This is about a patient who encountered a failed TKR due to improper selection as patient had bilateral OA Hip that was ignored in the initial stages. To overcome the problem she was advised bilateral hip replacement which would leave her with four replacements in the lower limb. She refused surgery and was told there are no alternative treatment options. This patient underwent a 3 week integrated course of IAYT at our center and she made a remarkable recovery. IAYT is a good non-surgical treatment that can be affective both before and after knee replacement and it should be considered as the first choice of treatment before surgery.

Key words: Integrated approach of yoga therapy; OA knees; total hip replacement; total knee replacement

INTRODUCTION
Arthritis can be quite disabling in old age. Osteoarthritis (OA) and rheumatoid arthritis (RA) are the most common types of arthritis with the former \(^1\) affecting 10% and the latter 3% of the world population. \(^2\) American College of Rheumatology (ACR) has laid down guidelines for the treatment of OA. \(^3\) Total knee replacement (TKR) is recommended for end stage arthritis when the non-pharmacological and pharmacological therapies fail. \(^4\) However, replacement surgeries are not the answer as many joints are affected in both conditions. Resorting to replacement surgeries without giving an adequate trial of the recommended non-surgical treatment will not give the desired results.

Even in those cases where surgery is absolutely indicated, giving a fair trial of non-pharmacological treatment would improve the outcome of surgery. The value of making a correct diagnosis, following standard treatment protocol, meticulous planning and correct timing of surgery is essential for a favorable outcome.

Integrated approach of yoga therapy (IAYT) is one such technique which by virtue of its Holistic approach is an ideal treatment option for OA and RA failing which surgery can be done. \(^5\) IAYT is a treatment concept developed at SVYASA. Here, a judicious combination of various well-known yogic techniques such as asana, meditation, pranayama and relaxation techniques are done and the treatment is to execute in a systematic and methodical manner. A combination of all these yoga techniques has been scientifically proved to be very effective in chronic medical and orthopedic problems like arthritis, low backache etc., And even after replacement surgery, IAYT helps in improving the post-surgical rehabilitation outcome thereby enhancing the effects of surgery.

Patients with bilateral OA hips present with pain, stiffness, loss of movements and limp.

CASE REPORT
A 52-year-old female patient presented with pain in both the hip joints since 3 months. She was unable to walk, stand, climb, or do any activities with her lower limbs.

She had undergone bilateral TKR in July 2012 for severe OA of both the knees. She was assured that she would be able
to walk freely after the surgery. No mention was made about the existing disease in the hip joints and about the need to operate both the hips. One month into the post-operative period after TKR the patient was totally unable to walk and was reduced to a wheelchair existence. Prior to surgery she was able to walk and do her day to day activities with pain. Even this was not possible after the surgery. When the patient went back to the surgeon seeking remedy, she was told that she needs to undergo bilateral hip replacement in order to walk again. When asked why this was not told to her earlier there was no response. When patient expressed her unwillingness for the surgery due to the previous bad experience and also due to extreme financial crunch to muster money for another twin replacement surgery. She was told to return back once she would not arrange money and until such time continue taking the pain killer. On request for any alternative method of treatment, the surgeon categorically said nothing could be done. It is then the patient approached me for treatment.

On enquiry, she told me that she was an old patient of RA and was on treatment since 2009. She did not have typical RA presentation and her problems started as pain in both the knees unlike a typical RA small joint presentation. Subsequently she did develop pain in the hands, feet, shoulder, hip, and wrist but hip the presentation was unlike a typical RA. Her RA test was 26 u/ml and the normal reading was up to 15 u/ml. Her other blood parameters and X-rays did not support the diagnosis of RA [Table 1].

In 2009, she underwent a diagnostic arthroscopy for pain in both the knees since 3 months. During the diagnostic arthroscopy she was diagnosed left medial meniscus tear with synovitis and partial medial meniscectomy, synovectomy and chondroplasty was done on 19/1/09. She had no fall or trauma to the left knee. She had no history of swelling etc., of the knee. Clinically, she was not diagnosed to have medial meniscus torn and no magnetic resonance imaging was done prior to arthroscopy. She always complained of bilateral knee pain and not a single joint pain. After the surgery, there was no relief in her pain in the knees and she was put on anti RA treatment by another orthopedic surgeon. She was also diagnosed to have diabetes and hypertension and was taking of treatment for these ailments also.

### Table 1: Clinical, Laboratory parameters and the treatment history

| Parameter                      | Treatment       | Day 1 | Day 10 | Day 20 | Day 30 |
|--------------------------------|-----------------|-------|--------|--------|--------|
| Pain score                     |                 | 9     | 6      | 3      | 2      |
| Hip disability %               |                 | 86    | 72     | 58     | 42     |
| Walking time                   |                 | 2 min 20 s (supported) | 2 min 5 s (dependent) | 2 min 10 s (without support) | 1 min 80 s |
| Movements (in degrees)         |                 | R     | L      | R      | L      | R      | L      |
| Flexion                        |                 | 5     | 10     | 5      | 10     | 20     | 30     | 20     | 30     |
| Extension                      |                 | 10    | 10     | 10     | 10     | 20     | 20     | 20     | 20     |
| Abduction                      |                 | 10    | 10     | 10     | 10     | 20     | 20     | 20     | 20     |
| Adduction                      |                 | 5     | 5      | 5      | 5      | 10     | 10     | 10     | 10     |
| External rotation              |                 | 5     | 5      | 5      | 5      | 10     | 10     | 10     | 10     |
| Internal rotation              |                 | 10    | 10     | 10     | 10     | 15     | 15     | 15     | 15     |
| Laboratory parameter          |                 |       |        |        |        |
| Hb %                           |                 | 10.7  | 9.8    |        |        |
| RA factor                      |                 | 26 IU/L |        |        |        |
| ESR                            |                 | 98 min/h | 103 min/h |        |        |
| CRP                            |                 | -     |        | 8.5 mm/L (November 12) |        |
| X-rays                         | Knees           | OA    | OA     | S/V OA (sever) |        |
|                                | Hip             |       |        | S/V OA (sever) |        |
|                                | Spine           | -     | Lumbar spondylosis |        |
|                                | Hand            | -     | Juxta-articular osteopenia |        |
| Densitometry                   | Hip             | -     | -1.3   | -      |        |
|                                | LS spine        | -     | -1.4   | -      |        |
|                                | R forearm       | -     | -1.3   | -      |        |
| Treatment method               |                 |       |        |        |
| followed in this patient       | Non-thermal     | -     | -      | -      |        |
|                                | Therapeutic exercise | HCQ   | -do-   | -do-   |        |
|                                | Pharmaceutical medicines | Losar N | -do- | -do- |        |
|                                | Shelcal/Dolo 650 | Loltrax/folic acid/Saaz |        |        |
| Health education               |                 | Nil   | Nil    | Nil    |        |

Hb = Hemoglobin; RA = Rheumatoid arthritis; ESR = Erythrocyte sedimentation rate; CRP = C-reactive protein; OA = Osteoarthritis; HCQ = Hydroxyl chloro quinoline
Her pain in both the knees steadily increased until 2012 despite taking regular treatment for RA such as methotrexate, folic acid. By then she had developed pain in the hands, hips, wrist, and shoulders. On July 2012 she was advised to undergo bilateral TKR and the diagnosis mentioned was severe bilateral OA! The X-ray reports have also suggested that the patient had OA knees and hips and lumbar spondylosis but her RA factor had shot up to 90 IU/ml (normal 0-30) on 4/7/12 and by 17/11/12 it had dropped to <10.4 IU/ml. Radiologists did not diagnose RA of the hips and knees, but a vague juxta-articular rarefaction in the hands was mentioned. Her erythrocyte sedimentation rate was 98, 103, 75 mm/h in 2011, July 2012, November 12 respectively. The radiology report on 23/8/12 had severe OA changes in both knees and hips.

**Clinical examination findings**

Patient was wheel chair bounded [Figure 1]. Her pain in both the hips as per the Numerical Pain Analog scale was nine. She had 86% disability in the hip as per the Western Ontario and McMaster Universities Osteoarthritis Index Score for the Knee Joint WOMAC score. She had Grade 3 tenderness in both the hips and the movements of the hip were severely restricted. Flexion - 50°, abduction - 10°, adduction - 50°. Flexion - 10°, external rotation - nil, internal rotation - nil, extension - 5°. Her walking time was 2 minutes 20 seconds for 50 meters [Table 1].

She was put on 30 days integrated physiotherapy consisting of ultrasound, interferential therapy and moist heat and IAYT practices and data’s were collected, after 10th day, 20th days and 30th day [Table 2]. She improved steadily in all the clinical parameters and she was off the wheel chair by the 3rd day and graduated to walking with the support on both sides [Figure 2], one side support [Figure 3] by 7th day as by 10th day she was walking without support [Figure 4]. Her pain also steadily decreased from 9 to 2 by the end

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**Table 2: Physiotherapy and IAYT module**

| Activity Description                                      | Duration   |
|-----------------------------------------------------------|------------|
| Physiotherapy: 20 min, TENS/USM                          | 10 min     |
| Shithilikarana vyayama (loosening exercises)              | 10.0 min   |
| Foot and ankle loosening practices                        |            |
| Passive rotation of each toe (clockwise and anti-clockwise) | 1.0 min    |
| Toe bending                                               | 0.5 min    |
| Passive rotation of ankle (clockwise and anti-clockwise)  | 0.5 min    |
| Ankle bending                                             | 0.5 min    |
| Ankle rotation (clockwise and anti-clockwise)             | 0.5 min    |
| Knee loosening practices                                  |            |
| Bending the knee in prone position                        | 1.0 min    |
| Knee bending-both sides                                   | 0.5 min    |
| Knee rotation-both sides                                  | 0.5 min    |
| Passive patella rotation                                  | 0.5 min    |
| Hip and waist loosening practices                         |            |
| Half butterfly                                            | 0.5 min    |
| Full butterfly                                            | 0.5 min    |
| Hip rotations (both internal and external)                | 0.5 min    |
| Upper limbs loosening practices                           |            |
| Finger loosening                                          | 0.5 min    |
| Wrist loosening                                           | 0.5 min    |
| Wrist rotation (clockwise and anti-clockwise)             | 0.5 min    |
| Neck loosening practices                                  |            |
| Forward and backward bending                              | 1.0 min    |
| Neck rotation (both clockwise and anti-clockwise)         | 0.5 min    |
| Relaxation-instant                                        | 2.0 min    |
| Strengthening exercises (sakti vikaasaka sukshma vyayama) | 5.0 min    |
| Back exercises (kati vikaasaka)                           | 0.5 min    |
| Thigh exercises (janga sakti vikaasaka)                   | 0.5 min    |
| Straight leg raise breathing-single and both legs          | 1.5 min    |
| Knee cap tightening-single and both legs                  | 2.0 min    |
| Ankle tightening exercises                                | 0.5 min    |
| QRT                                                       | 3.0 min    |
| Yogasanas                                                 | 10.0 min   |
| Standing asana                                            |            |
| Tadasana                                                  |            |
| Ardha kati chakrasana                                     |            |
| Ardha chakrasana                                          |            |
| Prasara padahastasana                                     |            |
| Lying asanas                                              |            |
| Bhujangasana                                              |            |
| Shalabhasana                                              |            |
| Deep relaxation technique                                 | 5.0 min    |
| Nadi Shudhdi Pranaayama-Nadi-shuddhi                     | 3.0 min    |
| Pranaayama is a slow rhythmic technique of alternate nostril breathing involving the phases of inhalation and exhalation using nasika muddra | |
| OM meditation is done seated in any comfortable meditative posture repeating the syllable OM mentally | 2.0 min |

IAYT = Integrated approach of Yoga therapy; US = Ultra sound; TENS = Transcutaneous electrical nerve stimulation; QRT = Quick relaxation technique; OM = Meditation
of 3 weeks. She expressed satisfaction at the outcome of the treatment as she had progressed from wheel chair to independent walking and that too after being told she had no other alternative!

DISCUSSION

This case throws up some important questions. What was the diagnosis in this patient? Was it a case of RA or OA? Why was arthroscopy done in 2009 and meniscectomy done when there was no complaints or clinical diagnosis of medial meniscus injury. From 2009 to 2012 patient was diagnosed and treated for RA and suddenly in July 2012 a diagnosis of severe OA knees was made and both knees were replaced. Though a diagnosis of severe OA hips were also made at the same time nothing was told to the patient about it! Though, the patient was suffering from polyarthritis nothing was done to rectify them by way of physical therapy, exercise therapy as is recommended by the ACR in the treatment of OA. Fifty two year was too young age to do a bilateral TKR, that too with bilateral OA hip. Replacing both the hips within 3 months after bilateral TKR would have left the patient with four artificial joints in her body. Not an ideal situation in a 52-year-old female patient. Furthermore, she had pain in the wrist shoulder and neck etc., Patient recovered after a 4 week course of IAYT.

Mechanism

Integrated physiotherapy relieves the pain and stiffness in the hip, knee and back, that had developed due to immobility and disease. IAYT is a well-known yoga practice and has proved to be very effective in the treatment of low backache,[6] common neck pain[7] and OA knees.[8] Other studies on the role of yoga on OA knees by Kolasinski et al.,[9] showed good results. The physical practices of IAYT helps in loosening and strengthening of all the joints in the body from head to toes.[5] OA does not affect only the knees but also involves all the joints in the body and this affects the postures, gait, mobility, balance and coordination. Sequentially programmed physical practices of IAYT, loosens all the joints, strengthens the weak muscles across the joints and corrects the malpostures and gait by strengthening the core postural muscles of the abdomen, back and lower limbs.[10] The breathing exercises of IAYT helps in improving the lung capacity and also increases the oxygenation resulting in fall of free oxygen radicals etc.

The mental practices of IAYT reduce the stress and anxiety associated with arthritis and prolonged treatment. Modification of life-styles and integrated health education increases the understanding of the disease in the patients and with this increased awareness and knowledge about the diagnosis and the treatment helps the patients come to terms with the talk about the problem and helps them to cope and adopt better. This improves the quality-of-life of the patient with OA of the knees.[11]
This all round or Holistic approach to this difficult problem helped this patient walk again pain free after months of wheel chair existence and loss of hope and depressions.

CONCLUSION

IAYT is now a scientifically proven effective treatment for OA knees. Even in this case where a patient had undergone bilateral TKR and was severely crippled, IAYT has helped the patient to be back on her feet. Conversely if this patient who had multiple joints problems with plenty of co-morbidities put on a 3 week pre-operative program of IAYT, the outcome of the surgery would have been better as the function of the hips, spine and other joints would have considerably improved as shown in the post-TKR IAYT.

We still recommend that for patients with OA Knees, we should truly practice the ACR recommended protocol. IAYT is a great value addition treatment for OA knees. Indication for surgery should be changed from failed conservative therapy to failed IAYT. All patients with OA knees should undergo IAYT. In the rare case of a patient requiring TKR, patients should undergo a 3 weeks program IAYT for a better outcome of the surgery!

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