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Research Article

Total Knee Arthroplasty on Cadaver- A Case Study

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ABSTRACT
Osteoarthritis is a common disease of aged population and one of the leading causes of disability. Incidence of knee osteoarthritis is rising by increasing average age of general population. Knee Replacement is a demanding procedure that requires a good working knowledge of knee kinematics, combined with experience. Optimal results require prostheses that mimic normal kinematics as close as possible: but also, implantation in good alignment, with acceptable ligamentous tension and balance. This is not an easy task as the knee is far from being just a hinge. Its motion is very much 3 dimensional. This article showing a case of unilateral knee arthroplasty of right knee joint during cadaveric dissection.

Keywords: Arthroplasty, cadaver, knee joint, osteoarthritis, Prosthesis,

INTRODUCTION

Osteoarthritis (OA) of the knee is one of the leading causes of disability among adults older than 65 years.[1] Patients with osteoarthritis experience significantly greater pain and functional deficits during normal daily activities, leading to a loss of productivity,[2,3] and worsening quality of life.[2,4] Although many conservative treatment modalities are available for the management of mild-to-moderate osteoarthritis, end-stage arthritis of the knee is best managed with total knee arthroplasty (TKA).[5]

An estimated 3.48 million procedures performed annually.[2] Even in its current state, TKA is the most commonly performed inpatient surgical procedure within the USA.[3] As value-based care initiatives continue to focus on hospital readmission rates and patient satisfaction, it has become essential for health care providers to develop and implement a multidisciplinary approach to enhance TKA outcomes while minimizing unnecessary expenditures. Here, we review several systems-based programs and specialty care practices that can be adopted into the standard orthopaedic practice for a multidisciplinary approach to TKA.

LITERATURE REVIEW

The knee joint can be thought of as a hinge joint with the primary motion of straightening and bending. In reality, it is more complex than a simple hinge, as the surfaces actually glide and roll upon one another. It is composed of the end of the thigh bone (femur), the top of the leg bone (tibia), and the kneecap (patella)[6].

The Knee Joint

The ends of the bone are covered with a smooth, glistening layer called articular cartilage. The articular cartilage is what allows the bones to glide smoothly with less resistance than ice sliding on ice[6]. The articular cartilage can be seen on X-ray as the space in between the bones[7].

X-ray of a Normal Knee Joint

The knee can be thought of as having 3 compartments - the medial, the lateral, and the patellofemoral. In addition, there are 2 special cartilages within the knee joint called the lateral and medial meniscus, which act as shock absorbers within the knee joint. There are also 2 ligaments within the knee, called the anterior cruciate ligament and the posterior cruciate ligament, which contribute to knee stability[6].

The osteoarthritis is one of the most prevalent condition resulting to disability particularly in elderly population. Osteoarthritis is the most common articular disease of the developed world and a leading cause of chronic disability, mostly as a consequence of the knee Osteoarthritis and/or hip Osteoarthritis[8]. History of diabetes, cancer, or cardiovascular disease and the presence of walking disability are major risk factors. Excess mortality is observed for all diseases with specific causes of death but is particularly pronounced for cardiovascular complications. Knee osteoarthritis is more important not only for its high prevalence rate compared with other types of osteoarthritis but also for its presentation at earlier age groups particularly in younger age groups of obese women. The incidence of knee osteoarthritis increases by age and further increase with longer lifetime and higher average weight of the population[9]. Pain and other symptoms of osteoarthritis may have a profound effect on quality of life affecting both physical function and psychological parameters. Knee osteoarthritis is not a localized disease of cartilage alone but is considered as a chronic disease of the whole joint, including articular cartilage, meniscus, ligament, and peri-articular muscle that may result from multiple pathophysiological mechanisms. It is painful and disabling disease that affects millions of patients[10] Despite its severe consequences, however most patients with knee osteoarthritis can be managed in the community and primary care [11].

Prevelence

About 13% of women and 10% of men aged 60 years and older have symptomatic knee osteoarthritis. The proportions of people affected with symptomatic knee osteoarthritis is likely to increase due to the aging of the population and the rate of obesity or overweight in the general population.[12]

Females, particularly those ≥55 years, tended to have more severe osteoarthritis in the knee but not in other sites. The results of this study demonstrated sex differences incidence of knee osteoarthritis particularly after menopausal age[13].

Etiology and Risk Factors of Knee

Osteoarthritis has a multifactorial etiology, which occurs due to interplay between systemic and local factors. Osteoarthritis affects all ages. The etiology of this debilitating disease in which several responsible genes are linked for its occurrence. Sports participation, injury to the joint, obesity, and genetic susceptibility predispose adolescent athletes to the development of premature osteoarthritis. Previous knee trauma increases the risk of knee osteoarthritis 3.86 times [14]. Old age, female gender, overweight and obesity, knee injury, repetitive use of joints, bone density, muscle weakness, and joint laxity all play roles in the development of joint osteoarthritis.

Determination of risk factors particularly in the weightbearing joints and their modification may reduce the risk of osteoarthritis and prevent subsequent pain and disability[15,17]. Mechanical

forces exerted on the joints are a significant cause of osteoarthritis and one of the most modifiable risk factors as determined by body BMI. Female sex, lower educational levels, obesity, and poor muscular strength are associated with symptomatic disease and subsequent disability[16]. Meniscal surgery increases the risk of future knee osteoarthritis by 2.6 times[17]. Patients undergoing partial meniscectomy and reconstruction surgery are significantly more likely to develop radiographic evidence of osteoarthritis than those with normal menisci[18]. In patients with knee osteoarthritis particularly at early stage of the levels of serum vitamin D is significantly lower than individuals without knee osteoarthritis. Vitamin D deficiency increases the risk of knee osteoarthritis by OR=2.63[19]. Higher than 6 pregnancies increase the risk of knee osteoarthritis by 1.95 times[20].

Risk factors of knee osteoarthritis

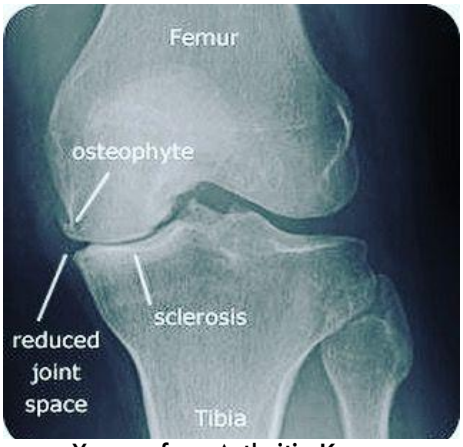
1. Age
2. Genetic susceptibility
3. Obesity Female gender
4. Trauma
5. Repetitive knee trauma
6. Muscle weakness
7. Joint laxity
8. Mechanical forces
9. Kneeling Squatting
10. Meniscal injuries

Clinical Features

Persist knee pain, limited morning stiffness, and reduced function are the three symptoms that are recommended for the diagnosis of knee osteoarthritis by the EULAR[21]. In addition, crepitus, restriction of joint movement and bony enlargement are also very useful for diagnosis of knee osteoarthritis. Pain is the most common symptom in knee osteoarthritis, a leading cause of chronic disability, and a major source of the disability attributable to osteoarthritis. Pain severity ranging from barely perceptible to immobilizing. Pain, in knee osteoarthritis typically exacerbates by activity and relieves by rest. In the presence of the above six symptoms and signs the probability of having radiographic knee osteoarthritis increases to 99%[22]. In advanced cases synovitis may appear and leads to pain at rest or night. Short duration of stiffness less than 30 minutes may be seen in osteoarthritis patients in the morning or following periods of inactivity. Tenderness to palpation of involved joints may be evident in physical examination. Joint effusions may be present, which typically exhibit a mild pleocytosis, normal viscosity, and modestly elevated protein. Crepitus during joint motion or walking is a common. Limitation of range of motion are all common signs of osteoarthritis of the knee. In advanced cases[36] malalignment may be apparent (genu varus or genu valgus).

Radiographic and MRI findings in knee osteoarthritis

1. Radiographic findings
   - i. Osteophytes
   - ii. Joint space narrowing
   - iii. Subchondral sclerosis
   - iv. Subchondral cysts
2. MRI findings in knee osteoarthritis
   - i. Cartilage abnormalities
   - ii. Osteophytes
   - iii. Bone edema
   - iv. Subarticular cysts
   - v. Bone attrition
   - vi. Meniscal tears
   - vii. Ligament abnormalities
   - viii. Synovial thickening
   - ix. Joint effusion
   - x. Intra-articular loose bodies
   - xi. Periarticular cysts



X-ray of an Arthritic Knee

Treatment of Arthritis

Depending upon the severity of arthritis and the patient's age, knee arthritis may be managed in a number of different ways. Treatment may consist of operative or non-operative methods, or a combination of both.

Non-operative

The first line of treatment of knee arthritis includes activity modification, anti-inflammatory medication, and weight loss. Giving up activities that make the pain worse may make this condition bearable for some people. Anti-inflammatory medications such as ibuprofen and newer Cox-2 inhibitors help alleviate the inflammation that may be contributing to the pain[38].

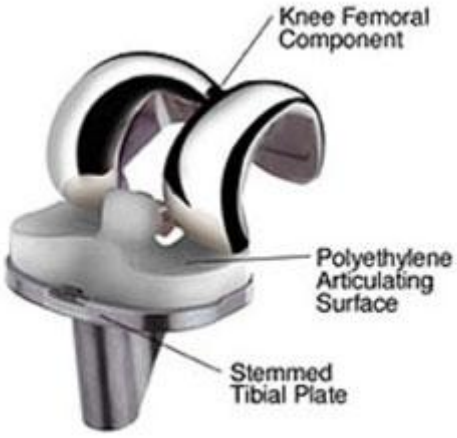
Physical therapy to strengthen the muscles around the knee may help absorb some of the shock imparted to the joint. This is particularly true for knee-cap (patello-femoral) arthritis. Special kinds of braces, designed to place transfer load to a part of the knee that is less arthritic may also help relieve the pain. Injections of medication inside the knee joint may also help alleviate the pain temporarily.

Furthermore, walking with a cane in the hand on the opposite side as the painful knee may help distribute some of the load, reducing the pain. Finally, weight loss helps decrease the force that goes across the knee joint.

A combination of these non-operative measures may help ease the pain and disability caused by knee arthritis.

Operative

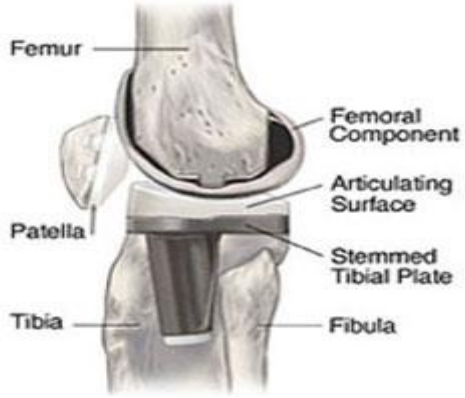
If the non-operative methods have failed to make your condition bearable, surgery may be the best option to treat knee arthritis. The exact type of surgery depends upon your age, anatomy, and underlying condition. Some examples of surgical options to treat arthritis include an osteotomy, which consists of cutting the bone to realign the joint; and knee replacement surgery.



Knee Replacement Implant

An osteotomy is a good alternative if the patient is young and the arthritis is limited to a one area of the knee joint. It allows the surgeon to realign the knee to unload the arthritic area and place

weightbearing on relatively uninvolved portions of the knee joint. For example, a patient who has begun to become more bowlegged might be realigned to be more knock-kneed in order to redistribute the load across the joint. The advantage of this type of surgery is that the patient's own knee joint is retained and could potentially provide many years of pain relief without the disadvantages of a prosthetic knee. The disadvantages include a longer rehabilitation course and the possibility that arthritis could develop in the newly aligned knee.



Picture of Implant in Knee

Knee replacement surgery involves cutting away the arthritic bone and inserting a prosthetic joint. All of the arthritic surfaces are replaced, including the femur, tibia, and patella. The arthritic surfaces are removed, and the ends of the bone are replaced with the prosthesis, like capping a tooth. The prosthetic component is generally made of metal and plastic surfaces which are designed to glide smoothly against one another.

X-ray of a Total Knee Arthroplasty

Total Knee Replacement

History

Total knee replacement surgery was first performed in 1968, and has evolved over the years into a reliable and effective way to relieve disabling pain and allow patients to resume their active lives. Improvements in surgical techniques and implant design and construction have helped make this one of the most successful orthopedic procedures today. As the population has become older and remained more active, the need for total knee replacement continues to increase. Today, approximately 270,000 total knee replacements are done every year in the United States.

The prosthetic implant

The implant for a total knee replacement is composed of 4 parts: the tibial and femoral components, a plastic insert, and the patella. The tibial and femoral components are made out of metal, usually cobalt-chrome, and are used to cap the ends of the femur and tibia after the arthritic bone is removed. The plastic insert is made out of ultra-high molecular weight polyethylene (UHMWPE) and fits into the tibial component, such that the highly polished surface

of the femur glides against the plastic. The patella component is also made of UHMWPE, and glides against the front of the femoral component. Altogether, the components weigh about 1 to 2 lbs. They are generally fixed to the bone with cement.

The procedure

The total knee replacement is performed in an operating room with a special laminar airflow system, which helps reduce the chance of infection. Your surgeon will be wearing a "spacesuit", also designed to reduce the chance of infection. The entire surgical team will consist of your surgeon, two to three assistants, and a scrub nurse.

The anesthesia for a total knee replacement is given through an epidural catheter, which is a small tube inserted into the back. This is the same type of anesthesia given to women in labor. You will be made numb from the waist down so that you will not feel anything. The catheter stays in for 1-2 days after the surgery to help with your postoperative pain control. During the course of the operation, you can be as awake or as sleepy as you want to be.

After the epidural block is administered, a tourniquet, or cuff, will be placed around your thigh. The tourniquet will be inflated during surgery to help reduce the loss of blood. The incision for a total knee replacement is made along the front of your knee. The incision will measure anywhere from 4 to 10 inches depending upon your anatomy.

The arthritic surfaces of the femur, tibia, and patella are exposed and removed with power instruments. In so doing, deformities of the knee are corrected, and the knee will appear straighter after surgery. The bone is prepared to receive the artificial knee joint, and then the prosthesis is inserted. During the closure, two drains are inserted around the operated area to assist with evacuation of blood. Staples are used to close the skin.

The entire operation will take from 1 to 2 hours. Afterwards, you will be brought to the recovery room, where your blood work and vital signs will be checked. Most patients can be brought to a regular room within a few hours; others will need to stay overnight in the recovery room, as determined by your surgeon and anesthesiologist. Patients generally stay in the hospital for 3-4 days following total knee replacement surgery.

Risks

Some of the risks of the surgical procedure include the loss of blood, formation of a clot in your leg, and the chance of infection. The overall incidence of these risks is very small. They should be discussed with your surgeon prior to proceeding with the operation.

Some of the risks of having a prosthetic knee include the chance that the parts may loosen or wear out over time, or the prosthesis may become infected. Again, these issues will be discussed with you by your surgeon.

Longevity

A total knee replacement has a lifespan much like anything with mechanical parts. Its longevity depends upon a variety of factors, including patient weight, patient activity, and mechanical properties of the prosthesis. The question of how long a prosthesis will last has been studied in detail over the years. Current studies indicate that over 85 percent of prostheses will function well for 20 years.

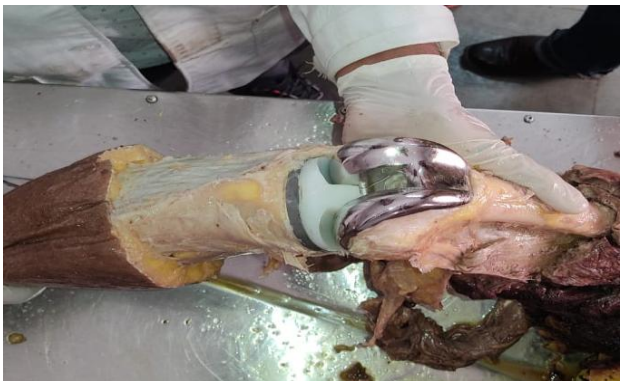
Procedure

The knee was opened as per Cunningham's dissection manual. Skin, superficial fascia and deep fascia was reflected, then we cut across the quadriceps tendon immediate to the proximal to the patella. The incision extended downwards to the tibial condyles at 2-3cm on either side of the patellar tendon. The patella turned down and the knee cavity was exposed.

Case Report

During conducting a routine dissection in Parul Institute of Ayurved, Vadodara, Gujrat. We found a prosthesis only on right knee joint. This was found in an adult overweighted female cadaver aged approximately 68 years. There were no other notable anomalies in the other limbs. The prosthesis containing four parts i.e., the tibial and femoral components, a plastic insert in between, and the artificial patella. The tibial and femoral components are made out of metal and plastic insert is made out of ultra-high molecular weight polyethylene (UHMWPE) and fits into the tibial component, such that the highly polished surface of the femur glides against the plastic.

(Right knee with Prosthesis)



(Showing movements of knee with prosthesis)

(During dissection showing prosthesis in knee joint)

DISCUSSION

- ✓ Now a day's osteoarthritis affects all age group of people and has a multifactorial aetiology, which occurs due to interplay between systemic and local factors.
- ✓ Knee osteoarthritis is more important not only for its high prevalence rate compared with other types of osteoarthritis but also for its presentation at earlier age groups particularly in younger age groups of obese women. The incidence of knee osteoarthritis increases by age and further increase with longer lifetime and higher average weight of the population.
- ✓ Sometimes expert consider the BMI also as a causative factor for TKA, but there no any strong reason because some persons have well body built with proper height and weight.
- ✓ The longevity of the total knee replacement depends upon a variety of factors, including patient weight, patient activity, and mechanical properties of the prosthesis.
- ✓ About 13% of women and 10% of men aged 60 years and older have symptomatic knee osteoarthritis. In female the prevalence rate is more.
- ✓ On some specific incidence reoperation of total knee arthroplasty (TKA) also happen

like such cases i.e., prosthetic loosening, knee instability, and sepsis etc.

- ✓ Day by day the greater part of society prefers for TKA due to supress the dependency on others and have less psychological involvement.

CONCLUSION

So, I concluded that the prosthesis found in that cadaver that's because of she was became an over weighted body built in her life and there is no any reason seen for TKA surgery. And also, on the left lower limb of that cadaver had formed osteophytes on the articular surfaces of femur, tibia bone which is the clear identification mark of the osteoarthritis.

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Research Article

Jirna pratishaya and its management through panchakarma- a case study

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ABSTRACT
Pratishyaya (rhinosinusitis) is very common now adays and moderately difficult to treat as it happens with *Sadhya Janak Nidana* (sudden causative factor). Also, many times, rapid and sudden onset is seen in *Pratishyaya* after exposure to even a weak causative factor. If this vicious cycle of *Nidana* (causative factor) and *Roga* (disease) continues and if treatment is neglected the *Roga* becomes *Jeerna*(chronic). At this stage it becomes necessary to cure the disease with *Shodhana* (purification) therapy rather *Shaman* (curative) therapy. In this type of chronic cases, we can get good results with only *Vamana Karma* (emesis therapy). In modern medicine conservative management is the first choice and if the disease is not managed by it, they prefer surgery to maintain the drainage and ventilation of the sinuses. *Vamana Karma* with or without *Nasya* (nasal instillation) can give complete improvement in such cases. The burden and risks of surgery can be avoided and the quality of the patient's life can be improved with *Ayurvedic* treatment.

Keywords: *Jeerna Pratishyaya*, Chronic rhinosinusitis, *Nasya*, *Vamana*.

INTRODUCTION

Ayurveda is the one and only medical system which gives the way of perfect living with nature.[1] Human body consists of five sense organs (Eye, Ear, Nose, Skin, Tongue), which are responsible for the perception of objects. If any obstacle comes in between the sense organ and sensory object, then perception of object becomes challenging (or difficult). Any disease of sense organ creates problem in perception of that particular object but allergic rhinitis is such a disease which creates problem in all the five sense organs. Nasal allergies can make it difficult for people to take part in both indoor and outdoor activities if their symptoms are not well controlled[2]. It significantly impairs patient's quality of life and productivity by imposing sneezing, nasal discharge, nasal blockage, headache, heaviness in head, itching in eyes, throat, palate etc.

According to WHO, 400 million persons worldwide suffer from allergic rhinitis[3]. Modern treatment modalities for the management of allergic rhinitis includes, H1 receptor antagonists (antihistamines), nasal decongestants, mast cell stabilizers, leukotriene receptor antagonists, corticosteroids and anti-cholinergic agents in oral or topical nasal formulations[4]. But all these give symptomatic relief only and are having severe side effects. Thus, modern medicines have no permanent answer for allergic rhinitis.

Asatmyendriyartha samyoga (improper use of sensory and motor organs in day-to-day life), *Prajnaparadha* (living against social and communal codes) and *Parinama* (time and season) are the root cause of any disease.[5] The above 3 factors are very important in preventive and curative aspects. In *Ayurved*, based on the symptoms of allergic rhinitis, it is mostly similar to *Vataja pratishyaya*. *Acharya Sushruta* dealt *Vataj pratishyaya* in *Nasagat rogas* along with its complete aetiology, prodromal symptoms, diagnosis, prevention and treatment guideline[6].

In the present case, visiting ENT OPD of Parul Ayurved Hospital, Parul University, Vadodara, Gujarat, treated with the *Chikitsa* sutra mentioned in *Ayurvedic* classics.

REVIEW OF LITERATURE

Pratishyaya is *nasagata* disease. It is described from *samhita kala* in *Brihattrayee* as well as *Laghutrayee*. It is described as a cause of *Kasa roga*, as a *purvarupa* of *Rajyakshma* and as a

symptom of *Vega vidharaj*, *Kshayaja* as well as *Vishamasanaja Yakshma*. In *Sushruta Samhita*, it is given in more detailed as a separate chapter.

Charak Samhita:

- *Acharya Charaka* described *Vaspa vegadharanam* as a cause of *Pratishyaya* in seventh chapter *Navegandharaniyadhyaya* of *Sutra Sthana*. *Acharya* described *Pratishyaya* as a *lakshana* of *Sahasajanya*, *Dhatukshayaj* and *Vishamashanaj Shosha* in the chapter-*Shoshanidan* of *Nidan Sthana*. In eighth chapter-*Rajyayakshma chikitsadhyaya* of *Chikitsa Sthana*, *Pratishyaya* is given as a *purvarupa* and *lakshan* of *Yakshma*. In this chapter, *samprapti* as well as general treatment of *pinas* (*pratishyaya*) is described.
- In twenty sixth chapter-*Trimarmiya chikitsadhyaya*, *nidana* and *pathya* of *Pratishyaya* is given. The Symptoms as well as treatment of specific types of *Pratishyaya* i.e., *vataj*, *pittaj, kaphaj* and *tridoshaj pratishyaya* is described in this chapter.
- If patients neglect, all types of *Pratishyaya* changed into *Dusta Pratishyay*.

Sushruta Samhita:

- *Acharya Sushruta* described five types of *Pratishyaya* in the twenty second chapter *Nasagata roga vigyan* of *Uttar tantra* but its detailed description *hetu*, *purvarupa*, *lakshana*, *chikitsa*, *pathyapathya* etc is given in twentyforth chapter *Pratishyaya pratishedhopkrama*.
- Acharya also described about *pakwa* and *apakwa pratishyaya*.

Videha Nimi:

- *Acharya Videha* described *Pratishyaya* as a self-limiting disease. *Acharya* described four stages of *Pratishyaya* ie., *Purvarupavastha*, *Rupavastha*, *Tivravastha* and *Upshamavastha* and their symptoms separately.

Madhava Nidan:

- *Acharya Madhavakara* described *Pratishyaya* in fifty eighth chapters - *Nasaroganidan* in second part of *Madhava Nidana*.

Sharangdhara Samhita:

- *Acharya Sharangadhara* described *Pratishyaya* in *nasaroga prakaran* of *rogagananadhyaya* of *prathama khanda*.

Bhava Prakash Nighantu:

- *Acharya Bhava Mishra* described *Pratishyaya* in sixty fifth chapter *Nasarogadhikara* of *chikitsa prakaran* of *Bhava Prakash Nighantu*.

Chakra Dutta:

- *Acharya chakrapani dutta* described mainly *chikitsa* of *Pratishyaya* in fifty eighth chapter *Nasa roga chikitsa*. He also described *Nava Pratishyaya* and *Jeerna Pratishyaya*.

Grammatical Derivation of *Pratishyaya*

- The word "*Pratishyaya*" is evolved from dhatu "*Shyeng gatau*" with *upsarga* "*prati*".
- It means that the movement of *doshas* is continuous in *Pratishyaya*.
- The disease in which the tendency of *kaphadi doshas* is move towards *vata* or out of nose is called *Pratishyaya*.
- *Nidan* Common *nidana* for *Pratishyaya* are described in different *samhita*.
- *In Sushruta Samhita Acharya sushruta* has described causes of *Pratishyaya* such as *Nariprasanga*, *Shirashabhitatam*, *Dhuli*, *rajah*, *Shitamatipratapa Mutrapurishasandharanam*. etc.[7]

Stages of *Pratishyaya*

Acharya Dalhana has quoted the reference of *Vridha Susruta* and described two stages of *Pratishyaya* according to degree of maturity which are following 1. *Amavastha*. 2. *Pakwavastha*.

1. *Amavastha*: *Vridha Susruta* has given symptoms viz. *Aruchi*, *Vaktra virasam*, *Nasa srava*, *Rooja*, *Shirogurutwama*, *Kshavathu*, *Jwara* etc.[8]
2. *Pakwavastha*: This stage is denoted by symptoms such as *Tanutwam ama linganama*, *Shirolaghuta*, *Nasalaghuta*, *Ghanapinkaphatwa* etc.[9]. *Purvarupa* The *purvarupa* has been stated by *Acharya Susruta*,they are *Shirogurutwama*, *Kshavathu*, *Angamarda*, *Parihristaromta*.[10]

According to *Acharya Videha* the symptoms are found in *purvarupavastha* are *Ghrandhumayanam*, *Kshavathu*, *Taludaranam Kanthadhwansa*, *Mukhasrava*, *Shirasahpuranam*.

Acharya Videha described that if above symptoms increases then *purvarupavastha* changed into *rupavastha*. *Acharya Videha* also described the symptoms of *tivravastha* of *Pratishyaya* which are as such *Sravadhikya*, *Nasanaha* feeling, *Ashrusrava*, *Jwara*, *Daurvalya*, *Shirahashoola*.

Acharya Videha also described the symptoms of *upshamavastha* of *Pratishyaya* which are thick and sticky *nasasrava*, opening of *nasasrota*, starting of natural respiration.

Stoping of *srava samprapti ghataka* of *Pratishyaya*

1. *Nidan – kapha vata prakopak ahara vihara* etc.
2. *Dosha – kapha vata pradhana alpa pitta, rakta.*
3. *Dushya – rasa and rakta.*
4. *Agni – jatharagni, rasadhatwagni.*
5. *Srotas – pranavaha, rasavaha, raktavaha.*
6. *Adhisthana – Nasa, Shiras.*

Samanya Laxana:

- Only *Acharya Charaka* and *Kashyapa* have mentioned about the general symptoms of *Pratishyaya*. According to *Charaka*:
- General symptoms of *Pratishyaya* are following *Shirahshoola Shirogaurav Ghranviplava Jwara Kasa Kaphotklesha Swarabheda Indriya Asamarthatva*. [11]

- According to *Kashyapa Samanya laxanas* are following – *Daurgandhta Parikledita* etc.[12]

Classification

According to various *Acharyas*, the disease *Pratishyaya* has been classified as under Acharya *Caraka* has described **four** types of *Pratishyaya* and considered *Dusta Pratishyaya* as advanced stage.[13]

Acharya *Susruta*, *Vagbhatta*, *Madhavakar*, Bhava Mishra, *Sharangadhara* have described five types of *pratishyaya*. According to *Rasa Ratna Samuchchaya*, there are six types of *Pratishyaya*. *Acharya Ras-Vagbhatta* described *malsanchayajanya Pratishyaya*.

Specific Symptoms

Vataja Pratishyaya

- According to *charaka*: - Symptoms are *Ghranatoda, Kshavathu, Jalabhsrava, Swarabheda.*[14]
- According to *Susruta*: - Symptoms are *Anadhyapihita nasa*, *Tanu nasa srava*, *Galtaluosthashosa*, *Nistoda shankha*, *Swaropghata*.[15]
- According to *Acharya Vagbhatta*: - Symptoms are *Mukhashosha*, *Kshavathu*, *Ghranoprodha*, *Shishirkaphasruti, Nistoda shankha, Shirahshoola, Kitika eva sarpanti, Chirapaki*.[16]
- *Acharya Madhava* and *Acharya Bhava Mishra* followed the symptoms of *Acharya Sushruta*.

Pittaja Pratishyaya.

- According to *Charaka*: - Symptoms are *Nasagrapaka*, *Jwara*, *Vaktrashosha*, *Ushnapittasrava*[17].
- According to *Susruta*: *Krishata*, *Panduta*, *Trishna nipidita* etc.[18]
- According to *Vagbhatta*:- Symptoms are *Nasagrapaka*, *Ushnatamrapittasrava*, *Trishna,Bhrama,Ghranapidika*.[19]

Kaphaja Pratishyaya

- According to *Charaka*: - Symptoms are *Kasa, Aruchi, Ghanasrava, Kandu*.[20]
- According to *Susruta*: - Symptoms are *Sheetashuklasrava*, *Gurushiromukhata*, Shirogalosthatalukandu etc.[21]
- According to *Vagbhatta*: - Symptoms are *Shwasa*, *Vamana*, *Gatragaurava*, *Mukhamadhurya*, *Aruchi*, *Kandu*, *Shuklakaphasruti*.[22]

Raktaja Pratishyaya

- According to *Charka*: -*Acharya Charaka* has not mentioned *Raktaja Pratishyaya*.
- According to *Susruta*: - Symptoms are *Tamrakshi*, *Daurgandhyaswasavadan*, *Gandhatanaveti*, *Krimipatana*, *Uroghata*.[23]
- Acccording to *Vagbhatta*: - Symptoms are *Nasakandu* and Other symptoms of *raktaja Pratishyaya* is similar to that of *pittaja Pratishyaya*.
- *Acharya Madhava* and *Acharya Bhava Mishra* followed the symptoms of *raktaja pratishyaya* of *Acharya Sushruta*.

Sannipataja Pratishyaya

- According to *Charaka*: - Symptoms are *Sarvanirupani, Tivraruja, Dukhadayee.*[24]
- According to *Susruta*: - it occurs again and again but stops suddenly.
- According to *Vaghbhat*: - Symptoms are *Sarvaja lakshana, Akasmat vridhishanti*.[25]

Dusta Pratishyaya

- According to *Charaka*: - Symptoms are *Avarodha*, *Abhighata*, *Srava,Gandhat* na veti, *Bahuprakopi*.[26]
- According to *Susruta*: - all types of *Pratishyaya* lead to this condition in a patient if he is not properly treated.
- According to *Vagbhatta*: - Symptoms are *Sarvendriya santapa, Agnimandya, Jwara, Kasa, Urahaparshwashoola, Mukhadaurgandhya, Nasa kledata and shushkata, Anahyata and vivriyata*.[27]
- *Acharya Madhavakar* and *Acharya Bhava Mishra* has followed the symptoms of *Dushta Pratishyaya* given by *Sushruta*.

Sadhya Asadhyata

- None of the *Acharyas* have mentioned *sadhya asadhyata* of *Pratishyaya* whereas according to almost *Acharyas*, in neglected or improperly treated case, the disease may change into *Dusta* condition, which is *krichcha sadhya*.[27]
- *Upadrava* According to *Susruta*, all types of *Pratishyaya* lead to vitiated condition without proper treatment and give rise to complications which are *Badhirya*, *Andhata*, *Aghranam*, *Ghornayanamayam*, *Kasa* etc.[28]

A CASE STUDY

A male patient of 58 years old, appeared in Parul Ayurved Hospital Panchakarma-OPD (OPD NO – 18015370) on 28/12/2019 with the **chief complaint of**:

- *Grathita Kasa* (Cough) at morning **since 1year**.
- Nose- running nose.
- Right inferior turbinate hypertrophy Congestion
- Ears- Both ear canals were clear, both tympanic membranes were intact and mild retracted
- Throat- Congestion was seen in posterior pharyngeal wall

Associated complaints

- No any associated complaints.

On admission

At the time of admission patient was conscious and well oriented.

Past history:

- No any H/O HYPERTENSION & DIABETICS.
- Not K/C/O –Allergy, Typhoid, Malaria, Dengue.
- No H/O – Trauma or Accidental Injury

On Examination:

- General condition: Moderate
- Pulse Rate: 75/min
- BP: 130/80 mm of Hg
- RR: 18/min
- HR: 76/min
- *Mala: Samyak*
- *Kostha: Mrudu*
- *Mutra: Regular*
- *Nidra: Sound*
- *Kshudha: Samyak*
- *Jihva: Liptha*

On first visit (Dt. 28/12/19) the patient was treated by some medicines for which was as follows;

1. Tab. *Vyoshadi vati* 2tabs three times a day.
2. Tab. *Laghumalini vasanta* 1tab three times a day.
3. Tab. *Laxmivilas rasa* 2tabs 3times per day.
4. *Sitopaladi churna* 3gms three times a day with water after food.
5. *Balachaturbhadra* ¼ gms 3times per day with water after food
6. *Bibhitak* ½ *gms* 3times per day with water after food.
7. *Yastimadhu* 1gms three times a day with water after food.
8. Amalaki ½ gms 3times per day with water after food.
9. Syp. Raktadipantaka 15ml 2times per day.

In second visit (Dt. 01/02/20) patient was prescribed with followings;

1. *Guda (Jaggery)* 20gms + *Adraka* (Ginger) 20gms at morning with empty stomach.
2. Tab. *Garlicon* 2tabs 2times per day.
3. *Vasaavaleha* 2times per day after food.
4. Tab. *Swasakuthar* rasa 2tabs 2times per day after food.
5. *Kanakaasava* 10ml 2times after food.

In third visit (Dt. 15/02/20) advised for admission and *Snehana karma* and followed by *Vamana Karma* was given as;

Table 1: Snehana Karma

Date	Treatment
19/02/2020	*Snehapana* with *Mahatikta Ghrita*- 30ml
20/02/2020	*Snehapana* with *Mahatikta Ghrita*- 60ml
21/02/2020	*Snehapana* with *Mahatikta Ghrita*- 90ml
22/02/2020	*Snehapana* with *Mahatikta Ghrita*- 120ml
23/02/2020	*Snehapana* with *Mahatikta Ghrita*- 150ml
24/02/2020	*Snehapana* with *Mahatikta Ghrita*- 180ml

Table 2: Vamana Karma

Initiation time	6.15am (26/02/2020- Wednesday)
Completion time	7.15am
Samyaka lakshna	*Pittant*
Antiki suddhi	*Pittant*
Total no. of *vega*	8 *Pradhan vega* + *5Alpa vega*
Maniki Pariksha	300ml
Samsarjana Karma	Advised for 5 days (*Madhyam suddhi samsarjana karma* of 2 *anna kala*)

Details of *Vamana Karma*:

13 *Vega* were observed and *Pittanta* (with *Aushadha*) *Vamana* was observed.

After treatment:

At the time of discharge complete relief was observed in all the symptoms. He was advised

- *Pratimarsha nasya* with *Anu taila* once a day for 1month.
- *Pathyadi Kwath*- 40ml, twice a day
- *Chitraka Haritaki Avaleha 1tea spoon* twice a day with milk, for 1 month.
- *Pathya Palana* (Do and don'ts) of *Pratishyaya*.

Table 3: Observation:

Symptoms	Before treatment	After treatment
Nasasrava (Watery nasal discharge)	++	No secretions
Kshvathu (Sneezing)	Occasionally	Absent
Shirahshool (Headache)	++	Absent
Kasa (Cough)	++	Absent

DISCUSSION

Acharya Sushruta has mentioned that each *Pratishyaya* should be treated with *Vaīmana Karma* except acute stage; followed by *Shirovirechaka Nasya*.[29] In the *Samprapti* (pathogenesis) of the disease it is mentioned that the *Dosha* get accumulated in *Shira pradesha* (head) and when aggravated by various *Nidana Sevana* (causative factors); it causes *Pratishyaya*.[30] It is known as '*Chaya Purvak Prakopa*'. In such conditions when the quantity of vitiated *Dosha* is more (*Bahu Dosha Avastha*), *Shodhana Karma* (purification) is required.[31] The selection process of *Shodhana Karma* depends upon the main site of the accumulated *Doshas* and their nearer route. In this case, *Vamana* was selected as no any other *Karma* works on vitiated *Kapha Dosha* as *Vamana* does.[32] *Pratishyaya* is an *Urdhvajatrugata Roga* (diseases of head and neck) and *Shira* (head) is the site of *Kapha Dosha*.[33] In addition to that while describing the benefits of *Vamana Karma Acharya Charak* has mentioned that *Murdha* (head) and *indriya* (sense organs) get purified with the help of *Vamana Karma*.[34]

Hence *Vamana Karma* is indicated in *Pratishyaya*. Once *Urdhva Kaya* (upper body) *Shodhana* is achieved by *Vamana* then *Shiro Virechana* (purification of head) is done to remove the *dosha* from the *Shir Pradesha* with the help of *Nasya* to get complete relief. But in this patient, he got complete symptomatic relief after *Vamana Karma* with Oral medicine. Then patient had taken *Nasya* (nasal instillation) after *Vamana* (emesis) with Anu taila. This mucosal thickening may resolve with *Shirovirechaka* Nasya. *Anu Taila* gave better result in *Kshavathu* (Sneezing), *Nasavarodha* (Nasal obstruction), *Tanusrava* (Watery nasal discharge), retracted tympanic membrane, Gandhahani (Loss of smell), *Kandu* (Itching) and turbinate hypertrophy.

In modern medicine the line of treatment of Rhinosinusitis is antibiotics, decongestant, antihistaminics[35] and if not relieved with medicines FESS (Functional Endoscopic Sinus Surgery) is suggested. With the Ayurvedic management patient can get relief from the disease and can skip risks of severity.

CONCLUSION

In this case the patient was suffering from *Jeerna Pratishyaya*. With *Vamana Karma* (emesis therapy) only patient got complete relief from all the symptoms. After *Vamana karma*, for removal of residual *dosha* and for further prevention of recurrence *Nasya* (nasal instilattion) should be given in such patients. Vamana karma followed by *nasya* karma provides much better and faster relief.

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