

ARTICULAR CARTILAGE DEFECTS

Management advances in recent times

PROF DR KAMAL BOSE

Articular cartilage plays a vital role in joint morphology – it is strong, durable, and able to withstand shear and axial forces acting through a joint. Defects rarely heal spontaneously. Cartilage repair knowledge continues to expand at a rapid rate and current research has demonstrated the ability to form hyaline cartilage in-vitro (which takes place in laboratory).

Articular cartilage defects rarely heal spontaneously. Although some patients initially may not have clinically significant problems, most will ultimately develop degenerative changes associated with cartilage damage.

There are many ways in which articular cartilage can be damaged. Treatment of cartilage lesions aims to relieve pain, reduce effusions and inflammation, restore function, reduce disability and postpone or alleviate the need for prosthetic replacement.

There appears to have been a sudden regeneration of interest in chondral defects (defects in the cartilages). Many techniques have been used and include spangialization, abrasions, drilling, tissue autografts, allografts and cell transplantation.

Arthroscopic abrasion arthroplasty

Arthroscopic abrasion arthroplasty, introduced approximately 20 years ago, was an alternative to open debridement procedures. It was suitable for older patients with degenerative

arthritis of the knee.

Microfracture technique

This technique was developed to enhance chondral resurfacing by providing a suitable environment for new tissue formation and taking advantage of the body's own healing potential.

The microfracture technique offers many advantages over concentrated drilling procedures. It is more biological and is an attempt to produce articular cartilage.

Mosaicplasty

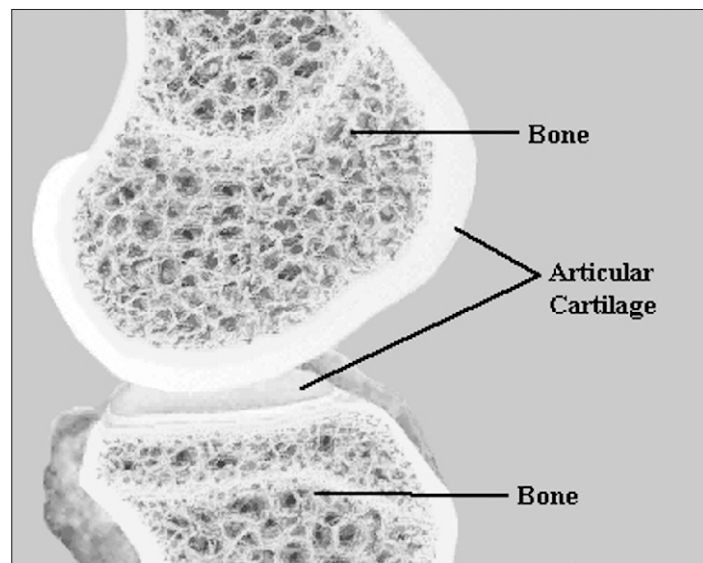
Autogenous osteochondral grafting (bone and cartilage graft) represents an innovative and promising treatment for chondral and osteochondral articular cartilage defects of the weight bearing surfaces.

A multicentric comparative, prospective evaluation of 413 arthroscopic resurfacing procedures revealed that mosaicplasty offered the most favourable long term clinical outcome. Intermediate term evaluation of femoral condyle implantation (3 to 6 years follow-up) and talar mosaicplasties (3 to 7 years follow-up) confirmed the durability of the early results.

The role of periosteum in cartilage repair

Periosteum (dense layer of connective tissue around a bone) has been used alone for biological resurfacing in humans for more than a decade.

Successful results were first reported in four out of four patients with osteochondritis dissecans (painful condition where pieces of articular cartilage become detached from the joint surface) and one patient with



avascular necrosis (condition where tissue cells die because their supply of blood has been cut) after 1 year follow-up. Four patients had no pain and one experienced a dull aching.

Periosteal grafts have also been used to resurface patellar defects in some patients.

Periosteal grafting is now indicated for patients younger than 35 years with isolated chondral or osteochondral defects attributable to trauma or osteochondritis dissecans who have not responded to arthroscopic microfracture.

The advantages of periosteal arthroplasty over mosaicplasty and autologous chondrocyte transplantation are that it causes minimal donor site morbidity and can be done in one operation without the additional expense of culturing the cells.

Autologous chondrocytes

used for articular cartilage repair

Articular chondrocytes are responsible for unique features of articular cartilage; therefore, it seems rational to use committed chondrocytes to repair a cartilaginous defect. From arthroscopically harvested cartilage, chondrocytes can be isolated by enzymatic digestion and expanded in culture 20 to 50 times the initial number of cells.

Cultured autologous chondrocytes covered with a periosteal membrane were first used 5 years ago to treat patients with chronic disabling symptoms of articular cartilage lesions of the knee.

This technique seemed most successful in patients who had injuries on the femoral surfaces that produced one localised deep cartilage lesion.

In the future, one can expect the use of chondrocytes or other chondrogenic cells for induced cartilage repair to take two directions:

1. Continuous use of implantation of in-vitro cultured cells with sutured top membrane consisting of a reabsorbable material with cells sealed in the membrane (sandwich technique); or
2. In-vitro construction of an osteochondral plug (composite graft with cartilaginous and osseous parts).

Current research is focusing on in-vitro regeneration of a three dimensional cartilage matrix from articular chondrocytes, sealed on a bioabsorbable polymeric scaffold. These scaffolds can be manufactured in an injectable form for a minimally invasive procedure or in a preformed state to treat large irreparable lesions, including those due to arthritis.

The ultimate goal of tissue engineering is to recapitulate normal chondrogenesis to create histologically and functionally normal tissue.

Summary

Cartilage repair knowledge continues to expand at a rapid rate.

Options available to surgeons for treating articular cartilage defects are:

- Marrow stimulating treatment
 - Abrasive arthroplasty
 - Microfracture
 - Autologous osteochondral transplant
 - Periosteal patches with or without autologous chondrocyte cell implantation
 - Osteochondral allograft
- Marrow stimulation techniques are indicated for small lesions

between 2 to 4 cm² as a primary treatment. They are cost effective and provide good short term results.

An alternative for patients who do not respond to marrow stimulation may be autologous osteochondral transplantation.

For lesions greater than 2 to 4.5 cm² there appears to be a gradual deterioration of the results of marrow stimulation and autologous osteochondral plug transfer. For these lesions, either periosteal patches with or without autologous chondrocyte cell implantation or osteochondral allografts should be used.

Conclusion

Cartilage restoration is a rapidly evolving field and management options must be continually reassessed.

Current research has demonstrated the ability to form hyaline cartilage in-vitro. This cartilage then with an appropriate scaffold and growth factor, would then be available for transfer directly to articular cartilage defects. It is important for orthopaedic surgeons to be aware of the latest developments so that they can provide the best and most cost effective treatment.

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The article is concise from its original one.

HEALTH AND SCIENCE BULLETIN

Risk factors for neonatal mortality in rural areas of Bangladesh

Neonatal deaths account for about half of all deaths among children under 5 years of age in Bangladesh.

The case-control study aimed to identify factors associated with neonatal death in rural areas served by a large NGO programme. Interviews were conducted with mothers of children born alive in 2003 who died within 28 days postpartum (142 cases) and did not die (617 controls). The main risk factors for neonatal death among singleton babies were: complications during delivery, prematurity, care for a sick neonate from an unlicensed "traditional healer", or care not sought at all.

The study findings indicate the need for identification of babies at high risk for death, community and home-based interventions, and improved referral facilities.

Source: ICDDR,B

Health Tips

Calcium, dairy may curb colon cancer risk

Men with high levels of calcium and dairy foods in their diet have a lower risk of colorectal cancer, research suggests.

Recent studies have generally reported a "modest inverse association between calcium intake and the risk of colorectal cancer," Dr. Susanna C. Larsson, of Karolinska Institute, Stockholm, and colleagues note in the American Journal of Clinical Nutrition. "However, findings pertaining to specific subsites in the colorectum have been conflicting."

The researchers studied the association between calcium and dairy foods and colorectal cancer risk in 45,306 men. The men were between 45 and 79 years of age and free of cancer at baseline.

A total of 449 men developed colorectal cancer over

an average of 6.7 years of follow-up. Of these, 276 tumors were located in the colon – 124 were in the upper part of the colon, often referred to as the proximal colon, 131 were in the lower part of the colon near the rectum, called the distal colon, and 21 in an unspecified subsite. The other 173 cancers were located in the rectum.

The colorectal cancer risk for men in the highest quartile of total calcium intake was 32 percent lower than men in the lowest quartile. A high intake of dairy food was also associated with a lower risk of colorectal cancer. Milk consumption had the strongest inverse association with colorectal cancer.

Source: American Journal of Clinical Nutrition

Hand washing could save a million lives each year

DR M KARIM KHAN

Each year, diarrhoeal diseases kill nearly two million children under the age of five years around world.

Just washing hands properly could save the lives more than a million children each year. So in other way we can say 50 percent of the diarrhoeal death can be reduced by proper hand washing.

Among many components of personal hygiene, hand washing before and after taking meal, after toileting is very important. It can reduce many gastrointestinal infections. Taking regular bath, wearing clean clothes, cutting nails regularly, drinking safe water and safe disposal of excreta have got tremendous positive impact on health.

We have not yet the practice of hand washing properly and timely. Hand washing is univer-



sally promoted in health interventions.

Studies in Bangladesh have shown a 14-40 percent reduction of diarrhoeal diseases with hand washing. In a study in Bangladesh it has been shown that 85 percent of the slum women and 41 percent of the rural women washed their hands using only water. However, most women rub their hands on earth or use soil and rinsed them with water during post defecation hand washing. (Ref: *Hand washing practice and challenges in Bangladesh, B A Haque, Environment and population research center, Bangladesh*). If they use soap and clean water during hand washing the reduction of bacteria will be definitely more significant.

Proper hand washing protect children from diarrhoea and also to some extent from pneumonia – the two biggest killers of children

below the age of five years.

Valerie Curtis, director of the hygiene center, London school of hygiene and tropical medicine and a global expert on the beneficial effect of hand washing said, "If you don't wash your hands after using toilet, your hands become a super highway for transmitting microbes from one person to another."

She also said, "faeces contains billions and billions of viruses and bacteria and they are number one enemy of public in spreading killer disease to children."

To get rid of these problem the best method is to use soap with water to wash hands.

The US center for disease control describes proper hand washing as follows:

- Use soap and running water
- Rub hands vigorously as you wash them
- Wash all surfaces (including backs of hands, wrists, between

fingers and under finger nails.)

- Rinse well and leave the water running.
- Dry hands with a single use towel.
- Turn off water using a paper towel covering freshly washed hands.

Prevention is better than cure. We can prevent around 50 percent of the diarrhoeal diseases simply by washing hands properly.

Parents, doctors, nurses, health worker, teachers, imams – all should try to convey the message of benefit of hand washing to the children. Please wash your hands and teach your children to wash hands properly to reduce the huge burden of diarrhoeal diseases.

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Ginger, pepper treat difficult cancers

REUTERS, Washington

Ginger can kill ovarian cancer cells while the compound that makes peppers hot can shrink pancreatic tumors, researchers told a conference.

Their studies add to a growing body of evidence that at least some popular spices might slow or prevent the growth of cancer.

The study on ginger was done using cells in a lab dish, which is a long way from finding that it works in actual cancer patients, but it is the first step to testing the idea.

Dr. Rebecca Liu, an assistant professor of obstetrics and gynecology at the University of Michigan Comprehensive Cancer Center, and colleagues tested ginger powder dissolved in solution by putting it on ovarian cancer cell cultures.

It killed the ovarian cancer cells in two different ways – through a self-destruction process called apoptosis and through autophagy in which cells digest themselves, the researchers told a meeting of the American Association for Cancer Research.

"Most ovarian cancer patients develop recurrent disease that eventually becomes resistant to standard chemotherapy, which is associated with resistance to apoptosis," Liu said in a statement.

"If ginger can cause autophagic cell death in addition to apoptosis, it may circumvent resistance to conventional chemotherapy."

Ginger has been shown to help control inflammation,

which can contribute to the development of ovarian cancer cells.

"In multiple ovarian cancer cell lines, we found that ginger-induced cell death at a similar or better rate than the platinum-based chemotherapy drugs typically used to treat ovarian cancer," said Dr. Jennifer Rhode, who helped work on the study.

A second study found that capsaicin, which makes chili peppers hot, fed to mice caused apoptosis death in pancreatic cancer cells, said Sanjay Srivastava of the University of Pittsburgh School of Medicine.

"Capsaicin triggered the cancerous cells to die off and significantly reduced the size of the tumors," he said.

The spicy compound killed pancreatic tumor cells but did not affect normal, healthy pancreas cells, researchers told the AACR meeting.

Last year the same team reported similar results with pancreatic cells in lab dishes. Pancreatic cancer is highly deadly, killing 31,000 of the 32,000 it will be diagnosed in this year.

Last month researchers in Los Angeles reported that capsaicin killed prostate tumor cells. Other studies have shown that turmeric, a yellow spice used widely in Indian cooking, may help stop the spread of lung cancer and breast cancer in mice.

Experts point out that many compounds shown to stop cancer in mice are not nearly as effective in human cancer patients.

NEWBORN CARE

Common-sense strategies for stressed-out parents

TAREQ SALAUDDIN

A newborn will bring a whirlwind of activity and excitement to your home and plenty of stress and fatigue as well. Whether you are a first-time parent or a seasoned veteran, caring for a newborn can be overwhelming. Use simple strategies to keep your stress under control.

Adjusting with a newborn

Round-the-clock baby care can turn your life upside down. Appreciate the joy your newborn brings to your life and cope with the rest one day at a time. Consider these practical tips:

Take care of yourself: Resist the urge to count caffeine as a major food group. Instead, eat healthy foods, drink plenty of water and get some fresh air. Do something you enjoy every day, either with your baby or on your own. Good habits will help you maintain the energy you need to take care of your newborn.

Get plenty of rest: Sleep is at a premium right now. Grab it when you can! Sleep when your baby sleeps. Work out a nighttime schedule with your partner that

allows both of you to rest and care for the baby.

Go with the flow: It is never too early to establish a routine, but let your baby set the pace. Allow plenty of time each day for nursing sessions, naps and crying spells. Keep scheduled activities to a minimum. When you need to head out, give yourself extra time to pack your supplies and change the inevitable out-of-door dirty diaper.

Expect a roller coaster of emotions: You may go from adoring your newborn and marveling at tiny fingers and toes to grieving your loss of independence and worrying about your ability to care for a newborn – all in the space of a single diaper change.

Share your feelings: Chances are, you and your partner are both tired and anxious. Talking about what is bothering you such as a strained budget or difficulty soothing the baby can help you stay connected. A shared laugh may help lighten the mood.

Accept a helping hand: When friends and loved ones offer to help, take them up on it. Suggest holding the baby, folding the laundry, running a few errands whatever would help you the most.

Relax your standards: Hide

the broom and leave dust bunnies where they lie. Store clean clothes in the laundry basket until you need them or in piles on the floor, for that matter. Clean the bathroom with a fresh diaper wipe. And yes, cold cereal is acceptable dinner fare.

Get out of the house: If you are going stir-crazy with a fussy newborn, take the baby out for a walk. If you can, let someone else take over for a while.

Nurture other relationships: Your newborn needs your love and attention, but you won't let your baby down by spending time with others. Set aside one-on-one time with your other children.

Keep your perspective: The newborn days won't last long. Step back and appreciate the moment even amid the chaos.

Know when to seek additional help: Parenting is a challenge even on a good day. If you're depressed or you're having trouble adjusting to life with a newborn, consult your health care provider or a mental health professional. Learning to handle the new stress in your life can help you enjoy the priceless riches parenting has to offer.

Your Doctor

Please suggest a solution.
Regards
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Answer:
As your statement says, your daughter is okay in growth and development and she has no major health problems. There is nothing to worry.

First thing you should realize that to maintain proper health and nutritional status, eating rice is not significant. As she has reached the age of 4 without rice, she is pretty habituated with other foods that satisfy her demand.

If you are interested in changing her food habit for the consumption of rice, you can inspire her by showing the example of other children of same age (maybe her friends and cousins). You can bring her to the dinner table with other children who eat rice. But you have to keep in mind that if she loses her appetite with other sorts of food, she is most likely

Dr Md Jahangir Alam
Child Specialist
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Sher-e-Bangla Nagar, Dhaka

*Dear Doctor,
My daughter is 4 years old. Her body weight and growth are okay. She has no disease now. She eats every kind of foods except rice. How can I change her food habit to rice?
She is also insistent. My wife and I always try to fulfill her needs and regard her thoughts. How can we decrease her insistence?*

On coming issue "Your Doctor" will respond to problems of nephrology (kidney diseases). Send your questions to Your Doctor, Star Health, The Daily Star, 19, Karwan Bazar, Dhaka 1215 or e-mail your problem to starhealth@thedailystar.net