

Flight Surgeon Notes #2

Aging and the Incidence of Cancer

Since our Vietnam days, the vicissitudes of age have been visited upon all of us. This column is addressed to our generation and the most common health problems that occur with age. Cancer is one problem of aging, but there are other problems that are less dramatic, but of equal misery.

Our previous column focused on the common problem of prostatic cancer. There is a general impression that all cancers increase with age. The truth is that the cumulative risk for all cancers increases with age, up to age 70 years, and then decreases slightly. For the U.S. population the lifetime risk of ever being diagnosed with cancer is approximately 41%. However, a significant proportion of older adults will reach the end of their life without a clinically detected cancer. At age 80, the risk of dying from cancer is 14.15%. If you are fortunate enough to reach age 90, cancer, as a cause of disease or death is uncommon.

There is no single documented risk factor for cancer; however, there are recognized risk factors for certain types of cancer. Smoking cigarettes increases the risk for lung cancer. If you have ever smoked, regardless of how long ago, it is prudent to obtain a chest x-ray every 2-3 years, since the impact of smoking may be delayed for many years. However, the relationship of cigarette smoking to lung cancer is not absolute. I have had several patients, over the past 50 years of practice, to develop lung cancer, despite having never smoked. I relegate this to Forest Gump's statement that, "S_ _ _ just happens!"

Type 2 diabetes (diabetes, not requiring insulin) is associated with an increased risk of colon cancer, breast cancer and pancreatic cancer. Diabetes occurs in 18.9% of the population over age 65. Excess body weight has been linked to an increased risk of many types of cancer and diabetes. There are a multitude of complex relationships between excess adipose (fat) tissue and tumor growth.

Colon cancer is the 3rd most frequent cancer in men and women. There is a time-honored principle in medicine that any person over age 40, who has a sudden change in bowel habit, is considered to have cancer of the colon until proven otherwise. Obviously, this does not include "Traveler's Trots" or "Ho Chi Minh's revenge." A colonoscopy is justified to rule out cancer.

Other Problems of Aging

None of us move as quickly as we did at age 20. The causes are loss of muscle mass, sedentary lifestyles and osteoarthritis. The areas most affected by osteoarthritis are weight-bearing joints, such as hips, knees and low back. Excess body weight aggravates the arthritis by putting more stress on these joints. Osteoarthritis is the most common cause of misery and disability as we age. There are definite genetic factors involved, with transmission through the female lines. Many years ago, during my fellowship in Rheumatology, it was taught that osteoarthritis is "wear and tear" arthritis. This is only a half-truth. Since I have a rebellious streak in my personality, my response was: "If that is true, why aren't all professional athletes crippled?!" I received many dirty looks, but no answer to my question. The true cause of osteoarthritis is due the changes inherent in aging bone.

As I previously noted, we have the same body as our early ancestors on this planet. Life during those early years was both brutal and brief. Sexual maturity and skeletal maturity are like hand-in-glove. When we are sexually mature, we stop growing taller. After we achieve peak bone density at age 20, we begin to lose bone. This occurs between ages 20-25 and continues for the remainder of our life. Since the skeleton is the foundation of the human body, this means that life was over for the majority of our ancestors. And, since our ancestors lived for such a short period of time, osteoarthritis rarely was a problem.

A brief discussion of bone biology is necessary to explain osteoarthritis. Bone, no less than every tissue of our body must constantly renew itself by exchanging old bone for new bone. During our growth phase, the exchange of new bone for old results in a surplus of new bone. This accounts for physical growth of the skeleton. However, after skeletal maturity is achieved at age 20, each exchange of old bone for new results in a progressive deficit inside of bone. This explains why bones become hollower with age. This weakens bone strength, resulting in osteoporosis. But, on the surface of every bone, there is a layer of cells that compensates for this loss by adding more new bone than is lost with each exchange. This explains why, with increased longevity, as bones age, they become *more hollow* and *larger in diameter*.

In the world of physics, there is mechanical advantage for a tube that becomes hollower while the walls of the tube become thicker. This positive bone balance on the surface of bone increases the strength of bone by compensating for the interior bone loss of osteoporosis. But, for every blessing there is a curse. The curse is osteoarthritis. Estrogen slows down this deposition of bone. Women, therefore, become symptomatic during menopause as estrogen levels decline.

Bone is laid down in the direction of stress imposed on it. There is more stress on a bone next to another bone (i.e.; a joint) than there is in mid shaft. The additional bone laid down near a joint deforms bone by tendon displacement and wearing out of the cartilage. This deformity interferes with flexibility and mobility. It is also painful. Anti-inflammatory medications can ease the pain up to a point. In large joints, such as hips and knees, cartilage cannot repair itself. When the extent of disease results in bone-on-bone, the only satisfactory treatment is joint replacement. Hip and knee replacement surgery have revolutionized treatment for arthritis and given people back their lives. This surgery has become so routine that any competent orthopedist can perform the surgery.

Future columns will note other issues of aging. Suggestions are welcome!

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