

# All factors cause cardiac artery stenosis

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## Case 411

### 4. All

#### 【Progress】

He had no symptoms of ischemic brain disorder, although severe stenosis of bilateral carotid artery was found. He stayed in watchful observation.

#### 【Discussion】

Carotid artery stenosis with calcification is not rarely encountered on routine neck CT. The mechanism of stenotic atherosclerotic carotid artery is basically the same as that of atherosclerotic coronary artery. In short, lipid or cholesterol adhesion to carotid artery intimal layer, first, occurs. Second, macrophages in charge of disposing foreign bodies, phagocyte fatty components. When too many foreign bodies phagocytized by macrophages, induce macrophages dying, precipitation and accumulation of fatty components at intima, forming plaques, coverage of plaques by endothelial cells. The repetition of this mechanism causes luminal stenosis of carotid artery. Further, the rupture of the plaques makes the part of the plaque fly distally and brain ischemic damages as distal embolization.

The risk factors for carotid artery stenosis are advanced age, smoking, hypertension, high cholesterol and/or high triglycerides, diabetes mellitus, and lack of exercise (sedentary lifestyle) and genetic family history (1, 2). Is there anything else?

Laboratory tests revealed no abnormal findings of these above factors, but previous illness history revealed that he had experienced tongue cancer (T2N1M0) and received radio-chemotherapy. After radiation of approximately 60Gy, he had undergone surgical resection of the tumor. Radiation treatment to the neck is reported to cause stenotic carotid artery.

It is becoming to be known that radiation therapy for head and neck malignancies causes carotid artery stenosis (3-8). Carotid artery stenosis was caused in 25% or greater of the patients with head and neck cancer treated by radiotherapy (3-8), while 4% of the patients with tongue cancer treated by radiotherapy (6). It was reported that the positive relation of carotid artery stenosis in the patients with the ages of 60 or more and with 5 years or more after receiving irradiation to head and neck (7, 8). But it is not yet to be clarified what radiation dose affect the adverse effect of carotid artery stenosis. Our case received 60Gy to the neck for tongue cancer.

The mechanism of post radiation carotid artery stenosis is reported that vasa vasorum is radiosensitive to radiation dose, and tunica adventitia falls into necrosis, fibrosis of adventitia layer, thickened vascular wall, and proceeds of atherosclerotic process (3-8).

Radiation treatment to large artery is supplied for lymph node prophylactic or radical irradiation not only at neck area but also pelvic area, especially in case of uterine cancer. Further, radiation treatment was given to paraaortic nodes. It is not clarified what radiation volume-dose causes iliac artery stenosis or aorta.

Carotid artery stenting or carotid endarterectomy is supplied for atherosclerotic carotid artery stenosis (9, 10). But in patients with carotid artery stenosis after radiotherapy is not so often given because of anticipating restenosis.

## 【Summary】

We presented a seventy-year-old male presented in our hospital for a painful neck nodule of 35X45mm size fixed at deep tissue, colored slightly red. He had received radiation therapy whose doses were given 60Gy fourteen years ago. Bilateral carotid artery stenosis with thick calcification (Left > Right) were depicted on contrast-enhanced CT. It is borne in mind that radiation doses of radiation treatment for head and neck malignancies cause stenotic carotid artery with calcification. Radiation doses damage to vasa vasorum, inducing necrosis of adventitia, fibrosis, thickened vascular mural and proceeds of atherosclerotic process.

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