VASCULAR ACCIDENTS IN SURGERY FOR CARCINOMA OF CERVIX

by

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The modern trend in the surgical approach to carcinoma of cervix is either radical or ultra-radical. Although they are performed when the disease is confined within the limits of pelvis, the extensions of these operations are much too wide than they were previously conceived. The study of behaviour of the growth even when it is far too late, adequate facilities of blood transfusion and the advent of modern and efficient antibiotics helped the surgeons to go deep into the matter and eradicate the disease as much as possible. In order to tackle the problem satisfactorily more and more surgeons are adopting and practising either radical or ultra-radical surgery. Consequently the number and variety of operative and post-operative complications are on increase.

Haemorrhage during these operations is most of the times heavy, and it is always more than in ordinary hysterectomy. Either to secure haemostasis or to remove lymph glands and parametrial tissue, big vessels of the pelvis are handled for which they become prone to vascular accidents. The effect of the accident varies from spasm of external iliac artery to complete obliteration of arterial pulsation in one or both lower limbs. The purpose of this communication is to place on record six cases of vascular accidents that took place while performing surgery for carcinoma of cervix.

Case 1. A 40 year old woman suffering from carcinoma of cervix, stage III, had difficult bleeding while undergoing the operation of Wertheim's radical hysterectomy. Internal iliac artery of the right side was ligated. Gangrene of right lower limb was noticed 24 hours after the operation. Subsequently gangrene extended upto the middle of the right thigh and three days later the left foot also showed evidence of gangrene. It started from the toes and extended upto the middle of the leg. The patient became very toxic and died on the 12th post-operative day. As the relatives of the patient did not give consent, postmortem examination was not possible.

Case 2. A 56 year old patient suffering from carcinoma of cervix, stage IV, underwent the operation of total pelvic exenteration. As a routine procedure both internal iliac arteries were ligated. Thirty hours after the operation gangrene was noticed in the toes of left lower limb. It gradually extended upto the knee. The patient became toxic and died on the 7th post-operative day. No postmortem examination was possible since the relatives of the patient did not give consent.

Case 3: A 50 year woman suffering from carcinoma of cervix, stage IV, had anterior pelvic exenteration. Internal iliac arteries of both sides were ligated. Gangrene was observed on the toes of right lower limb 24 hours following the operation. Subse-

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quently mid-thigh amputation was performed but the patient became toxic and died on the 12th day following the first operation. No consent could be obtained for postmortem examination.

Case 4. A 48 year old patient suffering from carcinoma of cervix, stage II, had Wertheim's radical hysterectomy. While removing the pelvic lymph glands on the right side the external iliac vein was injured. At the same time spasm of right external iliac artery was observed and it was to such an extent that the pulsation in the right foot became absent. In order to relieve the spasm 5 c.c. of 2 per cent novocaine was injected into the artery but the spasm continued. After the operation was over spinal anaesthesia was administered and there was complete recovery.

Case 5. A 46 year old woman suffering from carcinoma of cervix, stage II, underwent extraperitoneal lymphadenectomy preliminary to radical vaginal hysterectomy. The right external iliac vein was injured and in order to control the bleeding the vein was ligated. Soon after this, right external iliac artery went into spasm and pulsation in the right lower limb became absent. Twenty-four hours later embolectomy was performed and a saddle thrombus was removed from the bifurcation of common iliac artery. In spite of it 30 hours after the primary operation gangrene commenced in the toes of right lower limb. Mid-thigh amputation was carried out three weeks later. Patient remained well but she did not agree to further operation of radical vaginal hysterectomy.

Case 6. A 39 year old patient suffering from carcinoma of cervix, stage II, had extraperitoneal lymphadenectomy preliminary to radical vaginal hysterectomy. During the course of this operation a small twig from left external iliac artery was injured. In an attempt to secure the bleeding point by artery forceps both internal and external iliac arteries of the left side went into spasm. There was no arterial pulsation in the left lower limb. Left lumbar sympathectomy was performed with no improvement. Left lower limb was kept in ice pack for five days and fortunately enough there was no evidence of gangrene. Her general condition improved but there was no arterial pulsation in the dorsalis pedis artery. Five weeks later radical vaginal hysterectomy was completed and there was no further complication.

Discussion

The major vessels of the pelvis which are handled during the operation are internal and external iliac arteries along with its corresponding veins. It has been noticed that when the arteries are denuded of its sheath in order to remove the lymphatic glands, they become narrow in calibre. The arterial pulsation in lower limbs is not affected by it nor it produces any deleterious effect. It has also been noted that by the end of operation the arteries regain its normal calibre.

Injury to the external iliac artery or vein can happen during the removal of glands. If the arterial bleeding is controlled by pressure forceps then gangrene becomes inevitable. This undesirable effect can be avoided if the bleeding is checked by the pressure of a finger on common iliac artery and then the leak in the arterial wall is secured by means of silk. If there is heavy bleeding following the injury of external iliac vein, the corresponding artery in turn may go into a state of spasm which may be an attempt on the part of nature to reduce the blood flow through the injured venous channel. Ordinarily this spasm passes off without producing any harmful effect should the venous bleeding be adequately controlled. Continued spasm may lead to thrombus formation with ultimate risk of development of gangrene in lower extremity. Cases 4 and 5 demonstrate how the injury to the external iliac vein may produce arterial spasm. Fortunately, case 4 responded to

treatment and there was complete recovery whereas in Case 5 a thrombus developed leading to gangrene of lower extremity. In Case 6 arterial spasm started following the attempt to control the bleeding from a small twig of external iliac artery. It may be possible that a small area of the main artery was caught between the blades of artery forceps which may have resulted in spasm. In spite of treatment the arterial pulsation in the lower extremity did not reappear but luckily enough there was no gangrene for which no explanation can be offered.

Ligation of internal iliac artery is performed in order to control difficult bleeding during radical hysterectomy or as a routine procedure for exenteration operation, although it has a vast number of other indications. Apart from two terminal branches, the internal iliac artery during its stretch of one and half inches has no other branch. In order to maintain adequate collateral circulation and to avoid development of gangrene, an artery is usually tied distal to the origin of one of its branches. But due to anatomical variation, this principle cannot be applied to internal iliac artery. Once this artery is tied, then the portion proximal to the ligature will become a blind alley where blood will collect, clot and form a thrombus. If this thrombus formation extends upto the bifurcation of common iliac artery, then a portion of thrombus projecting into the lumen may be swept away by the strong current of blood flowing down the external iliac artery. Ultimately this detached thrombus which becomes an embolus may be lodged into arteries of lower limb and produce gangrene. If the thrombus formation becomes severe then it may creep up along the common iliac artery and may be placed at the bifurcation of aorta as a saddle thrombus. This condition will produce gangrene of both lower limbs. It is presumed that gangrene in Case 1 developed in this way whereas in Case 2 and 3, the cause of gangrene was due to embolism from the thrombus formed in the proximal part of the ligated internal iliac artery. Beside this there might be other unknown predisposing factors which might have added to precipitate this condition.

Review of the literature did not reveal any description of experience of similar kind. Many writers did mention about injury to large veins and difficulties arising from venous bleeding, but they hardly mention about complication arising from ligation of main arteries. Incidence of arterial spasm following ligation of veins for haemorrhage have been reported by Howkins (1964) but there was no mention of gangrene in lower extremity. As regards tying of internal iliac artery for pelvic exenteration, Howkins (1964), Brunschwig (1954) and Rubin and Novak (1956) recommend ligation of the main trunk whereas Lewis (1965) and Claye and Bourne (1963) advocate tying of anterior division of internal iliac artery. Although no reason has been provided as why the anterior division was selected it is felt that this procedure is safe and fits in with the general principle of tying a main artery as laid down by Farquharson (1966). Embolism if it occurs at all it will take place in gluteal region which is usual-

ly rich in collateral circulation. Chakrabarty (1969) reported a case of gluteal necrosis following ligation of internal iliac artery. It may not be out of place to add here that subsequent exenteration operations performed by the writer by tying the anterior division did not produce any untoward complication. Arterial spasm, if it is detected at the time of operation, may be successfully treated if the area where the artery is exposed is packed with gauze moistened with Priscol solution. If the spasm still persists, injection of novocaine in the artery may be useful. In some cases spinal anaesthesia and lumbar sympathectomy have also been advocated. If the gangrene develops in spite of taking all possible measures, then it should be detected as early as possible. For this purpose routine palpation of dorsalis pedis artery is found to be very helpful.

Summary

Six cases of vascular accidents following radical and ultra-radical surgery for carcinoma of cervix have been described. Four cases developed gangrene of lower extremity while two cases had only arterial spasm. The probable causes of vascular accidents are ligation of internal iliac artery (3 cases), injury to external iliac vein (2 cases) and accidental nipping of wall of external iliac artery (1 case). To avoid the complication of gangrene of lower limbs it is suggested that the ligation of anterior division of internal iliac artery would be safe and sound.

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