INTERNAL MAMMARY ARTERY ANOMALIES

Internal mammary artery (IMA) have been used widely in coronary bypass grafting (CABG). Therefore IMA angiography is performed in increasing numbers either post operatively for following up IMA graft patency and preoperatively. We performed selective IMA angiography to randomly allocated 100 cases and investigated the frequency of IMA anomalies. A total of 15 (15%) anomalies were observed in 100 patients. Seven of them (7%) had common origine with a large artery; 3 of them (3%) were tortuous arteries; 3 of them had large side branches; 2 of them (2%) had atypical origin and course.

We concluded that preoperative IMA angiography is not necessary as we found IMA anomalies relatively uncommon that can influence the surgical technic and results.

Key words: Internal mammary artery anomaly, coronary artery bypass grafting

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Internal mammary artery was first used, in late 1960's and in increasing numbers from the begining of 1980's to today as a surgical technique in CABG[1]. Today IMA is considered to be the superior conduit in coronary bypass grafting[2-6]. The prevalance of IMA anomalies and their influence on surgical thecnic and results are not well established. In this study we aimed to evaluate frequency of IMA anomalies.

Methods

Between February 1992-May 1992, we performed selective IMA angiography to patients who underwent coronary angiography for coronary artery disease at Koşuyolu Heart and Research Hospital hemodynamy laboratory. We gave numbers to the patients undergoing coronary angiography from 1 to 15 and performed selective IMA angiography to 1st, 5th, and 15th patients. 7F right coronary catheter was used for IMA angiography in 78 cases with standart technique[6]. 7F special IMA catheter was used in 22 patients as we can not cannulate left IMA with right coronary catheter because its curve is not sufficient for cannulation of the IMA orifice. The angiographic visualization was sufficient in 100 patients out of 104 (96%). Angiograms were recorded in 45° left anterior oblique and 30° right anterior oblique positions.

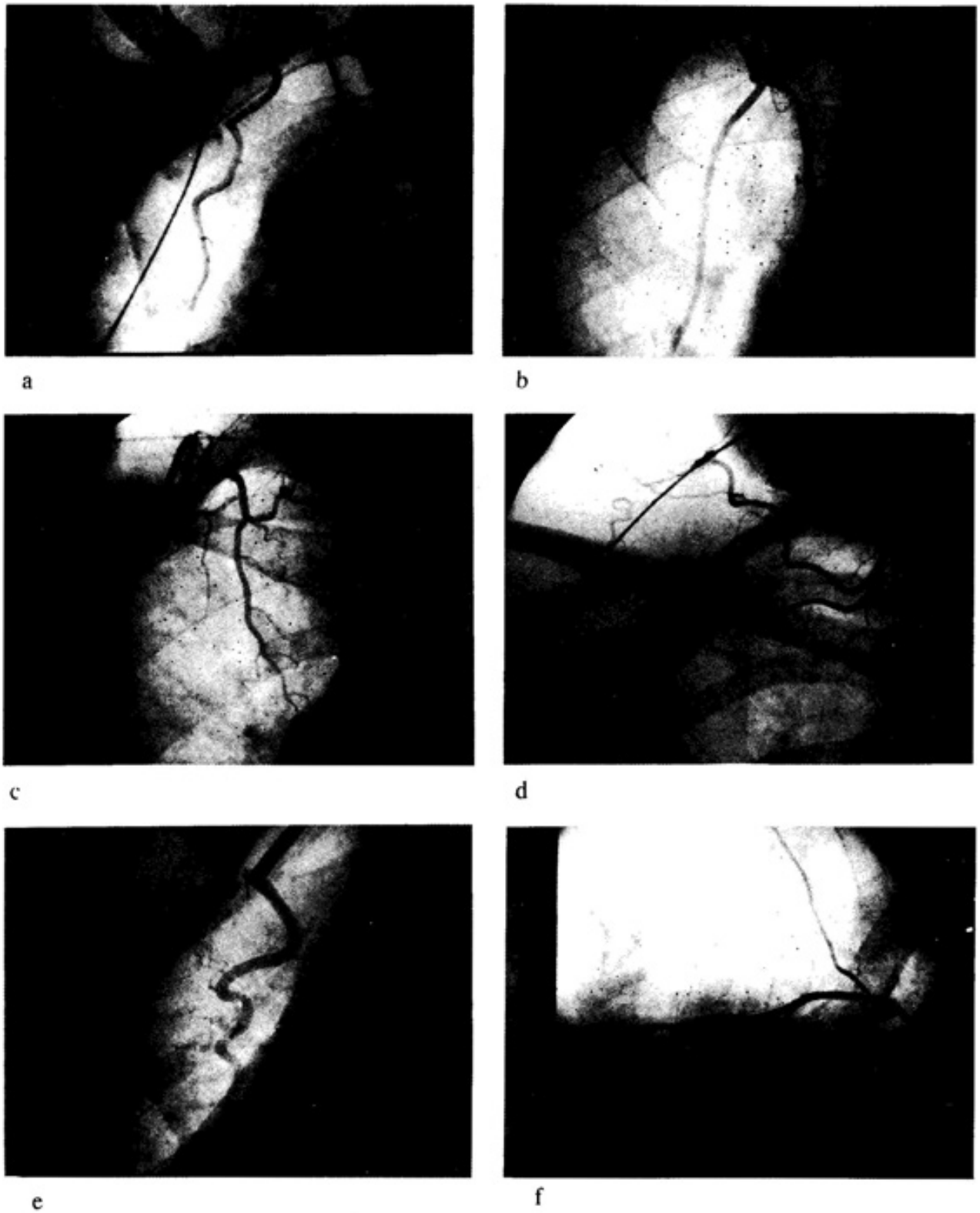

Figure 1. a and b, common origine with another large artery; c and d, a typical course of IMA; e, proximal large side branch; f, tortuous IMA

Six ml contrast material was injected in each position. Cineangiographic recordings were analized for evaluation of IMA anomalies. Anomalies were classified as; common IMA origin with truncus costocervicalis and/or truncus thyreocervicalis; large side branches with a diameter of more than 30% of IMA diameter, very tortuous arteries with more than three angles less than 90° and IMA's with atypical origine or course (Figure 1).

Results

Mean age of patients were 53±8 years (range: 33-71). 79 of them were male (79%), 21 of them female (21%). 15 (15%) anomalies were observed in 100 patients. Seven of them (7%) were common origine with truncus thyrocervicalis and/or truncus costocervicalis, 3 of them (3%) were tortuous arteries, 2 of them (2%) were IMA's with atypical origine and course (one of them had either atypical origine and course, other had only atipical course). These finding are summarized in Table 1.

Discussion

The internal mamamary arteries are considered to be the superior conduit and preferred in CABG[5-7]. To a some extend, there are some factors preventing IMA usage in CABG. These are IMA anomalies, low calibre of IMA, atherosclerotic lesions, spasticity and thecnical diffuculties during take down of IMA[8-11]. Some investigators published relatively high prevelance of IMA anomaly [11,12]. Therefore, it was recommended to perform preoperative aortography and/or selective IMA angiography[11-15]. Common origine with truncus costocervicalis and truncus thyrocervicalis which we found in most of our cases can cause scarcely steal phenomenon[16].

Table 1

	n=100	%
Normal	85	85%
Common origin	7	7%
Large side branch	3	3%
tortuosity	3	3%
atypical origine and course	2	2%

Large side branches, especially proximal ones near the IMA origin, are diffucult to divide because of poor exposure. If not divided, they may cause steal phenomenon. Tortuocity does not prevent IMA usage but dissection of very tortuous IMA's is difficult and can be easily injured during take down. Course and origine anomalies of IMA may give rise to thecnical diffuculties in dissection and may cause modification of surgical technics[19]. in this study, we found IMA anomalies lower than other authers (30%, 22% versus 15%)[11,12]. In addition, some anomalies quoted before (Large side branch, common origin, tortuocity) can be considered as variation of normals.

If these anotomic variations were considered as anomalies, these anotomic variations or anomalies have very low probability of preventing IMA as a conduit in CABG.

As a conclusion, preoperative IMA angiography for detection of anomalies is not neccessary in our opinion. But, the answer can be given with prospective investigations correlated with intraoperative findings.

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