·老年人冠心病介入治疗专栏·

老年冠状动脉慢性完全闭塞患者的临床特征分析

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【摘 要】**目的** 总结并探讨老年冠状动脉慢性完全闭塞（CTO）冠心病患者的临床、影像学和经皮冠状动脉介入治疗（PCI）的特点。**方法** 入选1995年1月至2014年12月入住沈阳军区总医院心内科行PCI的CTO患者3957例，其中老年组1452例（36.7%）。**结果** 老年组稳定型心绞痛比例低于非老年组，而不稳定型心绞痛患者比例高于非老年组，差异均具有统计学意义（$P<0.05$）。老年组高血压和心力衰竭比例高于非老年组，差异均具有统计学意义（均$P<0.001$）。老年组冠心病监护病房CCU住院天数和总住院天数均高于非老年组（$P<0.001$）。老年组多支血管病变比例，左主干CTO比例，绝对性、截然闭塞（刀切状）、长度≥15mm、直径≤2.5mm及桥侧支CTO比例均高于非老年组（$P<0.001$）。老年组CTO靶血管成功率低于非老年组（$P<0.05$），完全血运重建比例也低于非老年组（$P<0.001$）。**结论** 老年CTO病变患者具有不稳定型心绞痛、高血压、心力衰竭和多支病变所占比例偏高的特点，且病变程度复杂，增加了介入治疗的难度。

【关键词】老年人；冠状动脉疾病；慢性完全闭塞；经皮冠状动脉介入治疗

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Clinical characteristics of coronary chronic total occlusion in the elderly

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【**Abstract**】 **Objective** To analyze and summarize the characteristics of clinical, imaging and percutaneous coronary intervention (PCI) data in the elderly with chronic total occlusion (CTO) of the coronary artery. **Methods** The clinical data of 3957 patients (including 1452 cases ≥65 years old, 36.7%) with CTO verified by coronary angiography admitted in our department from January 1995 to December 2014 were collected and analyzed retrospectively. **Results** The incidence of stable angina was significantly lower in the elderly group than in the non-elderly group, but that of unstable angina was higher (both $P<0.05$). The elderly group had more patients suffering from hypertension and heart failure than the non-elderly group (both $P<0.001$). The duration at cardiac care unit (CCU) and total length of hospital stay were longer in the former than in the latter group (both $P<0.001$). The ratios of patients with multi-vessel lesion, left main coronary artery CTO, absolute occlusion, stump missing, CTO ≥15mm in length, CTO ≤2.5mm in diameter and bridging collaterals were significantly higher in the elderly group than in the non-elderly group ($P<0.001$). The successful rate of PCI and complete revascularization was lower in the elderly than in the non-elderly group ($P<0.05$). **Conclusion** The elderly CTO patients have higher rates of hypertension, heart failure and multi-vessel lesion, and are characterized by complex lesions and difficulty to PCI.

【**Key words**】 aged; coronary disease; chronic total occlusion; percutaneous coronary intervention

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慢性完全闭塞（chronic total occlusion，CTO）病变是经皮冠状动脉介入治疗（percutaneous coronary intervention，PCI）最难攻克的堡垒。老年（≥65岁）CTO患者由于存在较多的冠心病患病危险因素，病史较长，慢性反复性心肌缺血致使侧支循环建立，增加了PCI术的难度。有关老年CTO患者的临床病变特点以及PCI术的报道较少，本研究回顾性分析沈阳军区总医院心内科过去15年间连续收治的CTO-PCI病例，探讨老年冠状动脉CTO患者的临床特点和PCI术特点。

1 对象与方法

1.1 研究对象

入选1995年7月至2014年12月期间在我院住院行PCI术的CTO病变患者共3 957例，其中老年组（≥65岁）患者1452例（36.7%），非老年组（＜65岁）2505例（63.3%）。所有患者PCI术前均存在心绞痛或心肌缺血的客观证据，患者临床特征、冠状动脉造影结果、PCI相关资料及住院结果均来源于我院心内科冠心病介入治疗数据库。CTO病变定义为冠状动脉闭塞≥3个月、PCI之前“罪犯”血管心肌梗死溶栓治疗试验（thrombolysis in myocardial infarction，TIMI）血流分级0～1级的病变。排除心肌梗塞≤3个月、桥血管CTO病变患者。CTO病变包括左主干、前降支、回旋支、右冠状动脉及其主要分支（对角支、钝缘支、后降支、后侧支）。

1.2 治疗方法

所有患者术前服用常规剂量阿司匹林、噻氯吡啶或氯吡格雷等抗血小板药，术中按常规剂量静脉应用肝素，维持活化凝血时间（activated clotting time，ACT）250～350s。按标准方法行球囊扩张及支架植入术。靶病变PCI手术成功定义为：冠状动脉支架植入术后残余狭窄＜30%，前向血流达到TIMI分级3级，且无严重并发症。

1.3 统计学处理

采用SPSS12.0软件进行统计学分析。计量资料用$\bar{x} \pm s$表示，两组间比较采用t检验；计数资料以百分率表示，组间比较采用χ^2检验或Fisher确切概率检验法。$P < 0.05$为差异具有统计学意义。

2 结 果

2.1 两组患者的临床资料比较分析

两组患者一般资料比较，老年组年龄、血肌酐水平高于非老年组，而老年组男性患者比例、体质量指数、吸烟饮酒患者比例和甘油三酯低于非老年组，差异具有统计学意义（均$P < 0.001$）。老年组稳定型心绞痛比例低于非老年组，而不稳定型心绞痛患者比例高于非老年组，差异均具有统计学意义（均$P < 0.05$）。老年组合并高血压和心力衰竭例数高于非老年组，差异均具有统计学意义（均$P < 0.001$）。老年组在心脏病监护病房（cardiac care unit，CCU）住院天数和总住院天数均高于非老年组（$P < 0.001$；表1）。

2.2 两组患者冠状动脉造影结果比较分析

老年组患者多支病变1 219例（84.0%），共发现CTO靶血管1 667支；非老年组多支病变患者1 838例（73.4%），非老年组共发现CTO靶2 760支。老年组CTO患者多支病变比例高于非老年组（$P < 0.001$）。靶血管位置分布比较，老年组左主干CTO比例高于非老年组（$P < 0.001$），而左前降支CTO比例低于非老年组（$P = 0.005$）。老年组绝对性、截然闭塞刀切状、长度≥15mm、直径≤2.5mm及桥侧支CTO比例均高于非老年组（$P < 0.001$；表2）。

2.3 两组患者PCI术结果比较分析

两组间比较，老年组CTO靶血管PCI成功率低于非老年组（$P = 0.020$），完全血运重建的比例也低于非老年组（$P < 0.001$）。两组患者人均支架植入数、平均支架直径和平均支架总长度比较，差异均无统计学差异（$P > 0.05$；表3）。

3 讨 论

老年冠心病患者存在的危险因素较多，如高血压、糖尿病、高脂血症、肥胖、吸烟等[1-3]。老年人各器官生理功能也有不同程度的减退或障碍，往往合并脑血管疾病、外周血管疾病、肾功能不全、慢性阻塞性肺部疾病、凝血因子异常等，其中以肾功能不全最常见[4]。本研究中，老年CTO患者中不稳定型心绞痛、高血压、心力衰竭患者比例和血清肌酐值均较非老年组高。也有研究发现[5]，老年女性冠心病患者具有较多的危险因素。老年组的这些特点和危险因素的存在以及合并器官的功能障碍，都增加了老年CTO患者病变的复杂程度，进而增加了PCI术的难度，甚至影响到住院周期和预后，这在老年组CCU住院天数和总住院天数均高于非老年组的结果即可体现。

尸检资料发现，随着年龄的增长，动脉粥样硬化的发生率增加[6]。年龄>50岁者中≥50%存在单支冠状动脉明显狭窄。冠状动脉病变的支数及严重

表1 两组患者临床资料比较

Table 1 Comparison of clinical characteristics between two groups

Item	Elderly group (n = 1452)	Non-elderly group (n = 2505)	P value
Age(years, $\bar{x} \pm s$)	71.3 ± 0.1	53.9 ± 0.1	< 0.001
Male[n(%)]	940 (64.7)	2147 (85.7)	< 0.001
BMI(kg/m^2, $\bar{x} \pm s$)	24.9 ± 3.6	25.7 ± 3.1	< 0.001
Current smoker[n(%)]	462 (31.8)	1455 (58.1)	< 0.001
Alcohol drinker[n(%)]	231 (15.9)	852 (34.0)	< 0.001
Serum creatinine(μmol/L, $\bar{x} \pm s$)	89.65 ± 24.28	83.94 ± 21.50	< 0.001
Triglycerides(mmol/L, $\bar{x} \pm s$)	1.93 ± 1.36	2.40 ± 2.00	< 0.001
LDL-C(mmol/L, $\bar{x} \pm s$)	2.53 ± 0.87	2.56 ± 0.90	0.375
Fasting serum glucose(mmol/L, $\bar{x} \pm s$)	6.55 ± 2.66	6.44 ± 2.72	0.227
Stable angina[n(%)]	211 (14.5)	447 (17.8)	0.007
Unstable angina[n(%)]	1170 (80.6)	1941 (77.5)	0.022
Hypertension[n(%)]	969 (66.7)	1384 (55.2)	< 0.001
Diabetes mellitus[n(%)]	426 (29.3)	682 (27.2)	0.154
Prior MI[n(%)]	564 (38.8)	1032 (41.2)	0.146
Heart failure[n(%)]	625 (43.0)	869 (34.7)	< 0.001
CCU stay length(days, $\bar{x} \pm s$)	1.58 ± 0.12	1.03 ± 0.07	< 0.001
Hospital stay length(days, $\bar{x} \pm s$)	10.96 ± 0.85	9.10 ± 0.64	< 0.001

BMI: body mass index; LDL-C: low-density lipoprotein cholesterol; MI: myocardial infarction; CCU: cardiac care unit

表2 两组患者冠状动脉造影特点比较

Table 2 Comparison of angiographic characteristics of target CTO vessel location and CTO characteristic type between two groups [n(%)]

Parameter	Elderly group (n = 1667)	Non-elderly group (n = 2760)	P value
Target CTO vessel location			
LM	104 (6.2)	74 (2.6)	< 0.001
LAD	629 (37.7)	1159 (42.0)	0.005
LCX	324 (19.4)	492 (17.8)	0.181
RCA	610 (36.6)	1035 (37.5)	0.545
CTO characteristic type			
Absolute occlusion	1577 (94.6)	2467 (89.4)	< 0.001
Stump missing	665 (39.9)	761 (27.6)	< 0.001
CTO≥15mm	1309 (78.5)	1110 (40.2)	< 0.001
CTO≤2.5mm	297 (17.8)	315 (11.4)	< 0.001
Bridging collaterals	435 (26.1)	461 (16.7)	< 0.001

CTO: chronic total occlusion; LM: left main; LAD: left anterior descending; LCX: left circumflex branch; RCA: right coronary artery

表3 两组患者PCI结果比较

Table 3 Comparison of the outcome after PCI between two groups

Index	Elderly group (n = 1452)	Non-elderly group (n = 2505)	P value
Contrast medium(ml, $\bar{x} \pm s$)	262.6 ± 120.1	271.4 ± 117.2	0.116
Successful target vessels[n(%)]	1490 (89.4)	2525 (91.5)	0.020
Complete revascularization[n(%)]	1025 (70.6)	1886 (75.3)	< 0.001
Mean number of stents($\bar{x} \pm s$)	2.26 ± 1.46	2.18 ± 1.26	0.167
Average diameter of stents (mm, $\bar{x} \pm s$)	2.89 ± 0.29	2.90 ± 0.31	0.356
Average length of stents (mm, $\bar{x} \pm s$)	64.6 ± 31.3	60.3 ± 30.7	0.118

PCI: percutaneous coronary intervention

程度随年龄增大而增加。老年冠心病患者冠状动脉多支血管病变、复杂血管病变、左主干病变、弥漫性狭窄、血管完全闭塞、局灶性钙化、严重血管纡曲、冠状动脉内血栓及不发达的侧支循环等明显增多，斑块破裂和内膜下出血更为常见[7-10]。本研究中老年CTO患者多支病变比例高于非老年组，靶血管分布中，老年组左主干CTO比例高于非老年组，而老年组绝对性、刀切状、长病变、小血管（直径≤2.5mm）和桥侧支CTO的比例均高于非老年组，这也印证了老年CTO患者病变复杂、手术难度大的特点。

本研究中，老年CTO组靶血管PCI成功率及完全

血运重建的比例均低于非老年组，而在人均支架数、平均支架直径和平均支架总长度的比较中没有差异。Bell等[11,12]报道，CTO闭塞时间、类型、长度，以及有无心肌梗死等均可影响CTO病变PCI成功率。本文的结果也提示针对CTO病变PCI术的不利因素，在老年CTO患者的冠状动脉影像学特征中也几乎均有反映，故对于老年CTO患者，不论从临床特点还是从影像学出发都增加了介入治疗的难度，应该引起PCI术者的高度重视。

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