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· 专题报道 ·

新型冠状病毒肺炎患者6例临床特征和影像学表现

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[摘要] **目的** 总结6例新型冠状病毒肺炎(COVID-19)患者的临床特征和影像学表现,为COVID-19早期确诊和临床干预提供依据。**方法** 选择上海中医药大学附属第七人民医院2020年1月1日至2020年2月22日严重急性呼吸综合征冠状病毒2(SARS-CoV-2)核酸检测阳性的6例COVID-19患者,回顾性分析流行病学史、临床表现、影像学资料和实验室检查。**结果** 6例患者均有明确的武汉旅行或居住史,4例患者有发热,3例有咳嗽,2例有流涕、咽痛等上呼吸道症状,2例有头痛、肌肉酸痛等全身症状。6例患者胸部CT检查均可见肺部异常表现,病灶均为双侧分布,下肺病灶多于上肺,主要表现为双侧肺野外带多发磨玻璃影、实变影、“铺路石”征及不同程度纤维化。发病后较晚行胸部CT检查可见肺实变和明显纤维化。**结论** COVID-19影像学具有一定的特征性表现,结合患者流行病学史、临床表现和SARS-CoV-2核酸检测能早期诊断。

[关键词] 新型冠状病毒肺炎; 临床特征; X线计算机体层摄影术; 鉴别诊断

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Clinical features and imaging findings in six coronavirus disease 2019 patients

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[Abstract] **Objective** To summarize the clinical features and imaging findings of six coronavirus disease 2019 (COVID-19) patients, so as to provide evidences for early diagnosis and clinical intervention. **Methods** Six COVID-19 patients with positive severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) were enrolled from the Seventh People's Hospital of Shanghai University of Traditional Chinese Medicine from Jan. 1 to Feb. 22, 2020. The epidemiological history, clinical manifestations, imaging data and laboratory indicators were retrospectively analyzed. **Results** All six patients had a clear travel or residence history in Wuhan. Four patients had fever, three had cough, two had upper respiratory tract symptoms such as runny nose and sore throat, and two had systemic symptoms such as headache and muscle ache. Chest

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computed tomography (CT) showed that all the six patients had abnormal manifestations in bilateral lungs, and the lower lung lesions were more common than the upper lung lesions. The main manifestations were multiple ground-glass opacities, consolidation shadows, “crazy paving” sign and different degrees of fibrosis in lateral field of bilateral lungs. Chest CT examination later after onset showed lung consolidation and severe fibrosis. **Conclusion** The imaging of COVID-19 has special characteristics. Combined with the epidemiological history, clinical manifestations and the detection of SARS-CoV-2 nucleic acid, COVID-19 can be effectively diagnosed in the early stage.

[Key words] coronavirus disease 2019; clinical characteristics; X-ray computed tomography; differential diagnosis

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2019年12月暴发的不明原因肺炎经实验室病原学检测为严重急性呼吸综合征冠状病毒2 (severe acute respiratory syndrome coronavirus 2, SARS-CoV-2) 感染所致^[1]。SARS-CoV-2 属于β 属冠状病毒,是目前已知的第7种可以感染人的冠状病毒,与严重急性呼吸综合征冠状病毒和中东呼吸综合征冠状病毒同样可引起严重的呼吸系统疾病^[2-3]。2020年2月11日WHO将SARS-CoV-2感染所致的这一新型冠状病毒肺炎命名为 coronavirus disease 2019 (COVID-19)。COVID-19 疫情进展迅速,根据中华人民共和国国家卫生健康委员会发布数据,截至2020年2月22日24时全国累计确诊病例已达76 396例^[4]。本研究回顾性分析了上海中医药大学附属第七人民医院确诊的6例COVID-19患者的临床资料,总结其临床特征和影像学表现,为COVID-19的早期确诊和临床干预提供依据。

1 对象和方法

1.1 研究对象 选择上海中医药大学附属第七人民医院2020年1月1日至2020年2月22日qRT-

PCR检测SARS-CoV-2核酸阳性的6例COVID-19患者,其中男4例、女2例,发病年龄为28~63岁,年龄中位数(下四分位数,上四分位数)为36.50(30.25, 51.00)岁。所有患者均行胸部CT检查。
1.2 研究方法 根据《新型冠状病毒肺炎诊疗方案(试行第六版)》^[5]疑似COVID-19病例的判断标准进行临床筛查,疑似患者进入留院观察病房,采用qRT-PCR进行SARS-CoV-2核酸检测。分析其中SARS-CoV-2核酸阳性的6例COVID-19患者的病例资料,包括年龄、性别、流行病学史、临床表现、实验室检查及影像学资料。所有影像学资料均由2名资深放射科医师独立阅片并最终确诊。

2 结果

2.1 COVID-19患者临床症状 6例COVID-19患者临床表现见表1。2例患者以上腹部不适就诊,但无腹痛、腹泻。4例患者有发热;3例有咳嗽,无咳痰;2例除发热外还有鼻塞、流涕、咽痛等上呼吸道症状,2例有头痛、肌肉酸痛等全身症状。6例患者均无基础疾病和吸烟史,就诊时均为普通型,均有明确的武汉旅行或居住史。

表1 6例COVID-19患者的临床特征

Tab 1 Clinical characteristics of six COVID-19 patients

No.	Gender	Age (year)	Temperature (°C)	Cough	Other symptoms	Gastrointestinal symptom	History of Wuhan travel
1	Male	28	37.6	Yes	Rhinorrhoea	No	Yes
2	Female	47	38.2	Yes	No	No	Yes
3	Male	33	<37.3	Yes	No	Epigastric discomfort	Yes
4	Female	31	39.5	No	Headache, sore throat, and muscle ache	No	Yes
5	Male	63	38.8	No	No	No	Yes
6	Male	40	<37.3	No	Headache and muscle ache	Epigastric discomfort	Yes

COVID-19: Coronavirus disease 2019

2.2 COVID-19患者CT表现 6例COVID-19患者胸部CT表现见表2。6例患者均可见肺部异常

表现,病灶均为双侧分布,下肺病灶多于上肺。6例患者肺内病灶主要表现为肺野外带多发小片状

磨玻璃影,形态为小叶形、楔形或扇形等,部分有实变。病灶内血管影增粗,可见支气管壁增厚和支气管充气征,并存在小叶间隔增粗、网格影、“铺路石”征及纤维条索等肺间质纤维化表现。6例患者均无肺门和纵隔淋巴结肿大、肺空洞、树芽

征、小叶中心性结节和胸腔积液。2例患者发病后1周行胸部CT检查,见磨玻璃影中实变和纤维化明显增多(图1);1例发病后13d行胸部CT检查示肺内少许磨玻璃影,病灶以实变和纤维化为主(图2)。

表2 6例 COVID-19 患者胸部 CT 表现

Tab 2 Chest CT findings of six COVID-19 patients

No.	Lesion range	Lesion distribution	Ground-glass opacity	Consolidation	Pulmonary nodules	Vascular enlargement	Air bronchogram	Fibrosis
1	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	Yes	Yes	No	No
2	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	No	Yes	Yes	Reticular pattern, parenchymal bands
3	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	Yes	No	No	No
4	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	No	Yes	Yes	Reticular pattern, parenchymal bands
5	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	No	Yes	Yes	Reticular pattern, parenchymal bands
6	Bilateral	Peripheral lesion mainly in lower lobe	Pathy-like	Yes	No	Yes	No	Reticular pattern, parenchymal bands

COVID-19: Coronavirus disease 2019; CT: Computed tomography

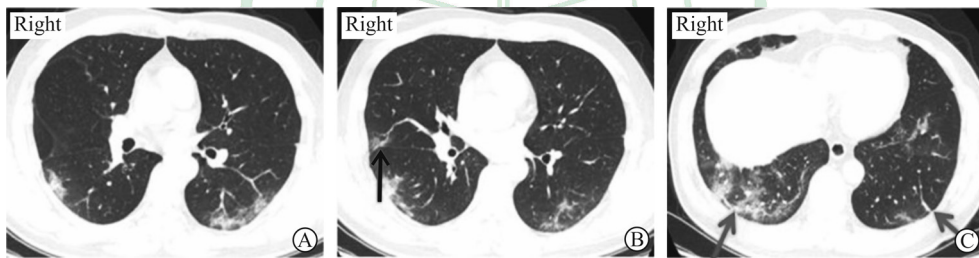


图1 1例40岁男性 COVID-19 患者 CT 表现

Fig 1 Chest CT findings of a 40-year-old male with COVID-19

The patient complained of epigastric discomfort for one week. A: Bilateral pathy-like ground glass opacities were mainly distributed in peripheral area; B: Vascular enlargement within the lesion of ground glass opacities (arrow); C: Reticular pattern, “crazy paving” sign and parenchymal bands were obvious in bilateral ground glass opacities of lower lobe (arrows). COVID-19: Coronavirus disease 2019; CT: Computed tomography

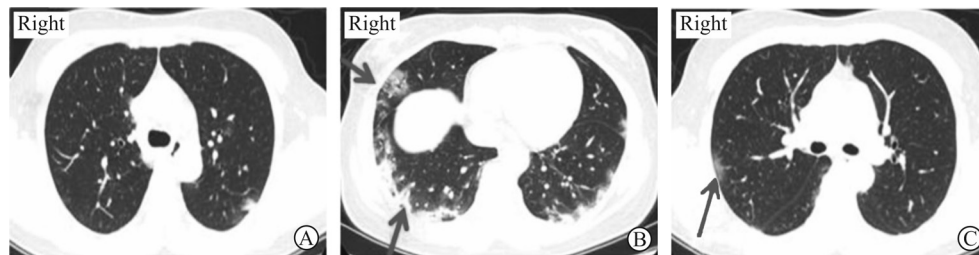


图2 1例31岁女性 COVID-19 患者 CT 表现

Fig 2 Chest CT findings of a 31-year-old female with COVID-19

The patient complained of fever, headache, sore throat and muscle ache for one week, and chest CT was performed 13 d after onset. A: Abnormal bilateral pathy-like shadow was mainly distributed in peripheral area; B: Consolidation and fibrogenesis were mainly abnormal lesion (arrows); C: A small amount of ground glass opacities in lung (arrow). COVID-19: Coronavirus disease 2019; CT: Computed tomography

2.3 实验室检查结果 6例患者白细胞计数均在正常参考值范围,1例患者淋巴细胞比例和淋巴细胞绝对值降低(分别为0.161和 $0.97 \times 10^9/L$),3例CRP水平增高(分别为21.02、34.57、26.88 mg/L)。4例患者首次SARS-CoV-2核酸检测阳性,2例患者第2次核酸检测阳性。

2.4 第2次核酸检测阳性患者临床特点 2例首次SARS-CoV-2核酸检测阴性,第2次核酸检测阳性。其中1例为28岁男性,有发热、咳嗽和咳痰症状,并伴有鼻塞、流涕,发病第4天就诊并行胸部CT检查,表现为双肺多发磨玻璃结节和微小结节,以双下肺外带分布为主,微小结节周围伴有“晕征”,结节内血管增粗穿行。另1例为47岁女性,有发热、咳嗽和咳痰症状,发病1周就诊,发病第8天行胸部CT检查,表现为两肺多发斑片状磨玻璃影,部分合并实变,以双下肺外带分布为主,病灶内可见支气管充气征及血管增粗影,双肺可见网格状影和纤维条索形成。

3 讨论

SARS-CoV-2是一种有包膜的单股正链RNA病毒^[6],其主要传播途径是呼吸道飞沫和密切接触,在相对封闭的环境中长时间暴露于高浓度气溶胶情况下也存在经气溶胶传播可能^[7]。根据目前的流行病学调查,COVID-19潜伏期为1~14 d,多为3~7 d^[5]。

本组4例患者有发热症状,3例有咳嗽症状,部分患者伴有头痛、肌肉酸痛等全身症状,其中2例患者主要表现为上腹部不适,与近期发表在*Lancet*的发热和咳嗽是COVID-19患者的主要临床表现,少数患者伴有鼻塞、流涕、咽痛、肌肉酸痛和腹泻等症状^[1,8]相符。Lai等^[9]报道严重COVID-19多发生在老年且患有基础疾病的人群,年龄与疾病严重程度相关。本组6例患者均有临床症状及肺内病灶,无气促和静息状态下氧饱和度下降的情况,属于普通型、轻型患者,这与本组患者均为青中年且没有基础疾病有关,提示SARS-CoV-2虽然感染力强,但多数患者为轻型^[1,8]。6例患者均有武汉旅行或居住史,文献报道绝大多数诊断为COVID-19的患者有明确的流行病学史^[10],因此流行病学史询问对COVID-19诊断至关重要。

本组6例患者胸部CT检查均可见双肺多发小

片状磨玻璃影,分布主要为肺野外带,且下肺病灶多于上肺,可合并实变、网格影、“铺路石”征和纤维条索影,部分患者磨玻璃影内见增粗的血管影、支气管壁增厚和支气管充气征。近期一项回顾性研究对121例COVID-19患者的胸部CT表现进行分析发现,COVID-19患者肺内早期CT表现包括以双侧肺野外带分布为主的多发磨玻璃影和实变影,随疾病发展肺内病灶数量增多、范围增大,可出现网格影、“铺路石”征等肺间质纤维化表现,且早期出现双肺病灶比例较低,随着时间推移累及双肺的患者比例明显增多^[11]。因此,对于早期胸部CT表现不典型的患者可数天内复查胸部CT,动态影像检查有助于COVID-19的诊断。

本组6例患者胸部CT均未见肺门和纵隔淋巴结肿大、胸腔积液、树芽征和小叶中心性结节和肺空洞表现。Chung等^[12]对21例COVID-19患者的胸部CT表现进行分析发现,所有患者均无胸腔积液、肺空洞、孤立性结节和纵隔淋巴结肿大。高璐等^[13]对COVID-19患者胸部CT资料进行分析也得到相似的结论。说明COVID-19患者胸部CT可能无树芽征或小叶中心性结节表现,这可能与SARS-CoV-2通过刺突蛋白与人血管紧张素转换酶2相互作用而感染人呼吸道上皮细胞,累及终末细支气管和呼吸性细支气管周围肺实质,进而累及整个肺小叶及弥漫性肺泡损伤的机制^[14]有关。因此COVID-19影像学主要表现为累及肺小叶的肺炎,而非细支气管炎引起的小叶中心性结节。以上COVID-19胸部CT常见和少见影像学表现有助于COVID-19鉴别诊断。

本组1例患者于2020年1月27日就诊,患者有武汉旅行史,有发热症状,但血常规白细胞计数正常,且患者胸部X线片检查未见异常尚不符疑似病例诊断,嘱患者居家隔离。患者在家隔离期间再次因发热就诊,行胸部CT检查提示典型肺内表现,确诊为COVID-19并在治疗13 d后复查胸部CT,提示明显双侧肺野外带实变和间质纤维化。因此,CT检查对早期发现病变及COVID-19诊断有重要意义。

qRT-PCR检测SARS-CoV-2核酸阳性为COVID-19诊断的金标准,本组有2例患者首次核酸检测阴性,第2次核酸检测阳性。目前文献报道首次核酸检测阳性率仅为30%~50%^[8],这与标本留取

方法是否到位、标本来源、试剂盒质量等有关。SARS-CoV-2 是 RNA 病毒,降解较快需及时送检,为提高核酸检测准确度,根据《新型冠状病毒肺炎诊疗方案(试行第六版)》要求^[5],建议尽可能留取痰液,气管插管患者采集下呼吸道分泌物,标本采集后应尽快送检。临床实践中,胸部 CT 检查与 SARS-CoV-2 核酸检测结合能更早、更精准地诊断 COVID-19。

总之,COVID-19 患者多数有发热、咳嗽症状,绝大多数患者有流行病学病史,早期影像学主要表现为双肺多发小片状磨玻璃影,以肺野外带分布为主,部分合并实变,病灶内有网格影和“铺路石”征,随着病情进展病灶增多范围增大、实变和肺间质纤维化加重。结合流行病学史、临床症状、胸部 CT 和核酸检测有助于 COVID-19 早期诊断。

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