Abstract:

Empyema thoracis ia condition where there is accmulation of infected fluid or pus in the pleural cavity.In this case,we found two causative organisms which are usually very uncommon and also resistant to almost many drugs(MDR).We faced lot of difficulties to manage this case even after thoracotomy and drainage of the empyema.So thought to report this case so that to aware physicians and intensivists for the peculiarity of the case.

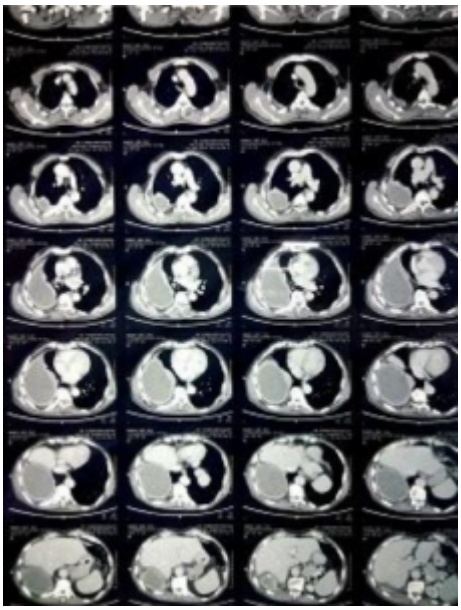
Case Report:

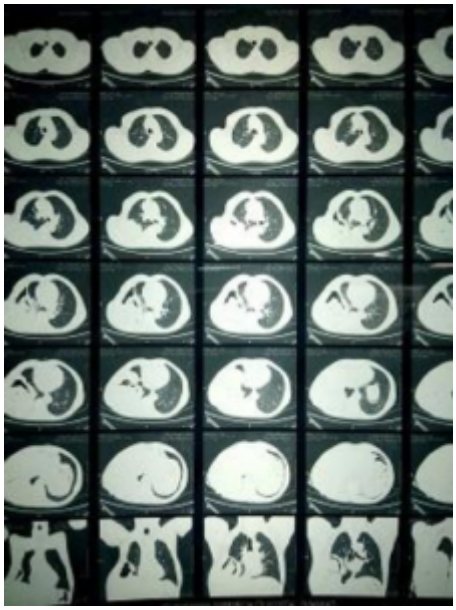
A 54 years old gentleman was admitted with the complaints of of walking difficulty, generalised weakness with more on the right sided weakness of both upper and lower limbs.The patient is a follow up case of left MCA infarct. So the patient was initially admitted in the dept of Neurology and later on evaluation,the patient was found to have hypoxia and decreased air entry and dull percussion note on the right side of the chest. CT thorax was done which revealed right sided huge opacity suggestive of massive pleural effusion. When on asking history the patient says that he had chest discomfort and breathing difficulty on and off from last one and half year duration. Pleural tap was done which showed pus aspiration from the right side of the chest.

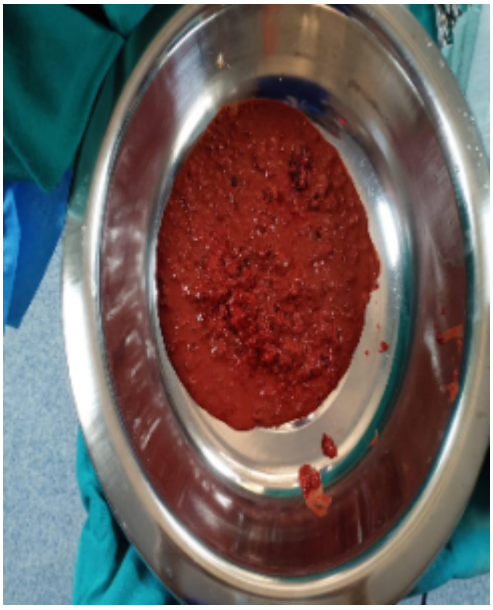
Initially pig tail catheter was placed but there was no enough improvement of the patient both clinically and radiologically after 4-5 days. subsequently, right posterolateral thoracotomy was done by CTVS. The pus and tissues were sent intraoperatively from the chest for the culture. Intraoperatively, the patient was drained with huge amount of at least 2-3 liters of pink colored pus and ICD was kept in situlater the patient was shifted to intensive care unit and put on invasive ventilation. He developed severe sepsis with shock. Initially his TLC is 9300/cumm with normal kidney function and PCT of 0.34.subsequently his TC count went upto 22,500/cumm. Later the culture report was reviewed which revealed **Serratia fonticola** and **Morganella morganii** ssp. Surprisingly both these two organisms are resistant to almost all drugs(**MDR).** The patient was on multiple antibacterials like inj meropenem(1 gm iv tds,sulbactum(1 gm iv tds),inj flucloxacillin(1 gm QID),inj polymixin (7.5 lacs iv bd) along with other supportive medications. But the condition of the patient was not improving. Looking at the culture report agai, inj **Ciprofloxacillin(500mg iv bd)** started which has the lowest MIC>=4 amongst all other antibiotics. The condition of the patient gradually started improving, TLC

count started declining to normal and patient became afebrile for 2-3 days. Even inj colistin (1MIU)was injected intrathoracic. But again after 4 days,the drainage of pus from the ICD increased causing the deterioration of the condition of the patient clinically. And eventually the patient expired on 10th day of admission.

Investigations:





Discussions:

First described by Gavini et al. in 1979, **Serratia fonticola** is a member of the Enterobacteriaceae family **found** in a wide array of environments, including drinking water, soil and sewage.

Serratia is a genus of Gram-negative, facultatively anaerobic, rod-shaped bacteria of the family Enterobacteriaceae. They are typically 1–5 µm in length and do not produce spores. The most common and pathogenic of the species in the genus, *S. marcescens*, is normally the only pathogen and usually causes nosocomial infections. However, rare strains of *S. plymuthica*, *S. liquefaciens*, *S. rubidaea*, and *S. odoriferae*have caused diseases through infection. *S. marcescens* is typically found in showers, toilet bowls, and around wetted tiles. Some members of this genus produce characteristic red pigment, prodigiosin, and can be distinguished from other members of the family Enterobacteriaceae by their unique production of three enzymes: DNase (nucA), lipase, and gelatinase (serralysin).

Serratia infections should be **treated** with an aminoglycoside plus an antipseudomonal beta-lactam, as the single use of a beta-lactam can select for resistant strains. Most strains are susceptible to amikacin, but reports indicate increasing resistance to gentamicin and tobramycin

Morganella morganii is a gram-negative rod commonly found in the environment and in the intestinal tracts of humans, mammals, and reptiles as normal flora. Despite its wide distribution, it **is** an uncommon **cause** of community-acquired infection and **is** most often encountered in postoperative and other nosocomial settings

The **diseases caused** by M. morganii are diversified; these **diseases** include pyelonephritis, septic shock, urinary tract infection, osteomyelitis, peritonitis, abscess, purple urine bag syndrome, joint hemorrhagic bullae.

Treatment emphasizes the importance of adequate drainage or removal of the infected tissues. Broad-spectrum antibiotic such as piperacillin-tazobactam was the first choice; other options include the use of third generation cephalosporins like ceftriaxone, cefipime or a fluoroquinolone.

In our case,it was tried to manage the MDR case by antimicrobials with minimum MIC and less resistant. Although the patient improved for a brief period of time but unfortunately succumbed to death due to its polymicrorbial resistance.

We reviewed few other articles (17)with clinical cultures positive for *S. fonticola*. Of these, 11 isolates were from the genitourinary system, most often as part of a polymicrobial culture. The majority of the other organisms recovered were recognized pathogens from the *Enterobacteriaceae* family. The cases suggest that when recovered in conjunction with other organisms, *S. fonticola* does not lead to enhanced virulence or worse clinical outcomes and may be a bystander. When detected alone, which is a rare occurrence, *S. fonticola* may function as a human pathogen.

While human infections described so far have not presented a therapeutic challenge in terms of resistance, *S. fonticola* has the potential of harboring resistance elements, including a chromosomal inducible AmpC beta-lactamase. Van Hoek et al. found an inducible FONA-type extended spectrum beta-lactamase (ESBL) associated with resistance to third generation cephalosporins in isolates from retail vegetables . While a chromosomal enzyme in *S. fonticola*, the same ESBL exists on a self-transferrable plasmid in *Enterobacter cloacae* . There is a theoretical risk that *S. fonticola* could transmit these resistance elements to other bacteria.

Falagas ME et al., has isolated M. morganii from 24 patients, of which 54% were from skin and soft tissue infections. Jong Hoon et al., study showed M. morganii is

known to cause opportunistic infection, especially in immune-compromised host. Majority of M. morganii infections are related to post-operative wound and urinary tract infection. McDermott C et al., reported that risk factors for M. morganii were old age, the presence of concomitant bacteremia, hospitalization, recent surgery and concurrent antibiotic use. There are reports of M. morganii causing infection of hydatid cyst of liver, neonatal sepsis, empyema, cerebral abscess and neck abscess

We report this case to create the awareness among clinicians and microbiologists that Serratia, Morganella morganii, even though uncommon, is a cause of Empyema thoracic, as it may have a slow insidious onset, with minimal characteristic signs and symptoms, a high index of suspicion is required because they can be sometimes so fatal and lifethreatening to the patients with multidrug resistant nature.So prompt Drainage with starting specific antimicrobials is so important without any delay.

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