Case report

*Lactococcus lactis cremoris* intra-uterine infection: About an uncommon case report

Aziz Slaoui a,b,*, Imane Benmouna b, Najia Zeraidi b, Amina Lakhdar b, Aicha Kharbach a, Aziz Baydada b

a Gynaecology-Obstetrics and Endoscopy Department, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco

b Gynaecology-Obstetrics and Endocrinology Department, Maternity Souissi, University Hospital Center IBN SINA, University Mohammed V, Rabat, Morocco

**ARTICLE INFO**

**Keywords:**
Intra-uterine infection
*Lactococcus lactis cremoris*
Extrapertoneal cesarean section

**ABSTRACT**

**Background:** When intra-uterine infection (IUI) is suspected or confirmed, intravenous antibiotic therapy providing coverage against common organisms (*S. agalactiae* and *E. coli*) is recommended to be administered immediately in order to reduce the risk of maternal and neonatal infectious complications. Nevertheless, it happens that some infections are due to uncommon microorganisms that do not respond to probabilistic treatment. Therefore, samples with bacteriological examination remain systematic. Moreover, the extraperitoneal cesarean section avoids the opening of the peritoneal cavity used in the Pfannenstiel technique and thus reduces the risk of infectious dissemination.

**Case presentation:** We hereby present the uncommon case of a 19-year-old primigravida woman who was referred to our facility for acute gastroenteritis at 34 weeks of gestation. The hospital course was complicated by premature rupture of the membranes followed by the development of fever, chills and deterioration of the fetal heart rate (FHR), imposing an urgent extraperitoneal cesarean section for suspected IUI with fetal impact. Bacteriological examination of a placental sample subsequently yielded growth of *Lactococcus lactis cremoris* which makes it to our knowledge the second case reported to date of an IUI due to this bacterium.

**Clinical discussion and conclusion:** IUI predominantly occurs by ascending bacterial invasion from the lower genital tract to the typically sterile amniotic cavity in the setting of membrane rupture. Extraperitoneal cesarean section serves as a viable alternative to classic transperitoneal delivery in the presence of uterine infection by controlling bacterial spread.

Our case serves as a reminder that IUI can arise from multiple pathogens, including *Lactococcus lactis cremoris* which is known as a harmless bacterium.

1. Background

Intra-uterine infection (IUI), also known as chorioamnionitis, is an infection of the fetal membranes and/or the maternal decidua and/or other components of the amniotic cavity, namely the amniotic fluid, placenta, umbilical cord and fetus [1]. In order to reduce the risk of maternal and neonatal infectious complications, intravenous antibiotic therapy providing coverage against common organisms (*S. agalactiae* and *E. coli*) is recommended to be administered immediately whenever an IUI is suspected or confirmed [1,2]. Once the diagnosis has been established, delivery should be considered. Vaginal delivery being the safer option and cesarean section should be reserved for standard obstetrical indications [1–3].

We herein present the uncommon case of a 19-year-old primigravida woman who was referred to our facility for acute gastroenteritis at 34 weeks of gestation. The hospital course was complicated by premature rupture of the membranes followed by the development of fever, chills and deterioration of the fetal heart rate (FHR), imposing an urgent extraperitoneal cesarean section for suspected IUI with fetal impact. Bacteriological examination of a placental sample subsequently yielded growth of *Lactococcus lactis cremoris* which makes it to our knowledge the second case reported to date of an IUI due to this bacterium [4].

* Corresponding author at: University Hospital Center IBN SINA of Rabat, Gynaecology-Obstetrics and Endoscopy Department & Gynaecology-Obstetrics and Endocrinology Department, Mohammed V of Rabat, Morocco.

E-mail address: azizslaou27@gmail.com (A. Slaoui).

https://doi.org/10.1016/j.ijscr.2022.107077

Received 11 March 2022; Received in revised form 8 April 2022; Accepted 9 April 2022

Available online 12 April 2022

2210-2612/© 2022 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
2. Case presentation

We hereby present the case of a 19-year-old woman, with no particular pathological history, primigravida primiparous, whose pregnancy was estimated at 34 weeks of gestation and 6 days according to the sonographic assessment within the first trimester, who was referred to our emergency department for pyrexic form of acute gastroenteritis. She reported diffuse abdominal pain over the previous 48 h associated with profuse aqueous diarrhea with 6 to 7 stools per day, without vomiting or fever. History of food intake revealed consumption of unpasteurized buttermilk few hours prior to onset of symptoms.

Upon admission, she was pyretric, normotensive, with no uterine contractions. Per vaginal examination revealed a long, posterior and buttermilk few hours prior to onset of symptoms.

The day after her admission, our patient presented spontaneous premature rupture of the membranes with discharge of a purulent and malodorous amniotic fluid. Physical examination revealed a fever with temperature of 39.4 °C, fundal tenderness and a still closed cervix. FHR monitoring showed severe late decelerations with a nadir of 70 bpm. The diagnosis of intrauterine infection with fetal repercussions drove a decision to proceed with emergency delivery. An extraperitoneal cesarean section by latero-vesical approach was therefore performed (Fig. 1), allowing the birth of a baby girl weighting 2700 g with an Apgar score of 5/7/10 at 1, 5 and 10 min respectively. The newborn was admitted to the neonatal intensive care unit, where she received amoxicillin for 48 h by intravenous route. A biopsy of the placenta was performed and sent to the microbiology laboratory. The cultures obtained revealed a Gram-positive catalase negative coccus. For organism identification, the Api 20 Strept kit (BioMérieux, Marcy l’Etoile, France) was used and Lactococcus lactis cremoris was isolated. This bacterium was susceptible to amoxicillin. The patient was therefore managed with simple amoxicillin 1 g 3 times daily for 10 days and became afebrile within 48 h. The postoperative course was uneventful for both mother and child. Thanks to the extraperitoneal technique used for the cesarean section, the patient was able to recover very quickly and started eating the same day. She was discharged from the hospital at D2 postpartum with her newborn.

3. Clinical discussion

Initially listed in the genus Streptococcus, it was not until 1985 that L. lactis was reclassified in the genus Lactococcus [5]. It is a gram-positive, spherical, heliolactate, non-spor forming, facultative anaerobic intestinal bacterium that can be divided into three subspecies: L. lactis subsp. lactis, L. lactis subsp. cremoris and L. lactis subsp. hordniae [6]. The subspecies L. lactis cremoris is the most interesting in the cheesemaking industry. They have the advantage of bringing a correct acid production, impeding the growth of undesirable microorganisms thus allowing the preservation, as well as flavor-forming ability as they tend to cause less bitterness [6]. It is commonly considered to be non-pathogenic; however, some human infections have been reported recently regardless of the patient’s age, gender and immune status. Therefore, its pathogenic potential is becoming well known by the scientific community. To our knowledge, our case is the second published case of Lactococcus lactis cremoris IUI and the 27th worldwide for other infectious sites [4,7–31]. Indeed, a review of the literature (Table 1) allowed us to find the 26 cases published before ours and allowed us to highlight some of the features of this uncommon infection.

Among these cases, women accounted for 41% of the global total, including our patient, making a sex ratio of 3:2 [4,10,16,19,20,22,24,25,28,29,29]. The age varies from 1 year, more exactly 19 months [13], to 79 years [22]. Although the number of reported cases is limited for a proper epidemiological analysis, it indicates that the infection can affect men and women almost evenly, from infancy to old age.

Concerning risk factors, some authors have suggested that immunocompromised subjects are more susceptible to the disease; however, we found only 26% of the cases, including ours, with a compromised immune status [4,10,19,21,27,30]. Although the evidence for increased susceptibility of pregnant women to infection is quite weak, immunological alterations during this period may impair pathogen clearance [31]. Therefore, we chose to include them in cases of compromised immunity. Pregnancy was reported in 7% of cases whereas history of oro-dental pathologies has been found in 30% of cases [8,12,17,19–21,24,31]. Nonetheless, the most significant risk factor remains the consumption of unpasteurized dairy products, which was found in 52% of patients, including ours [7–10,13,17,18,21,23,27,28,30,31].

Regarding pathophysiology, the mode of invasion was most often considered to be hematogenous (88%) as in the seven cases reported of endocarditis [15,17,20,23,26,29,31], the five cases of nervous system infection [7,11–13,24], the five cases of hepatobiliary system infection [8,14,16,22,25], the three cases of pleuropulmonary infection [9,18,30], the first case of IUI [4] as well as in the cases of articular infection [28], ocular infection [19] and septicemia [27]. But it could also occur by loco-regional spread as in the two cases of cervical soft tissue abscesses from a potential oral site infection [10,21]. Our patient presented with gastroenteritis with profuse diarrhea prior to premature rupture of the membranes. This suggests that the occurrence of IUI may result from an ascending infection in the setting of membrane rupture.

All authors reported collecting appropriate microbiological samples prior to the administration of an empiric antimicrobial therapy, which made it possible to obtain cultures confirming the diagnosis of Lactococcus lactis cremoris infection. It is interesting to note that all the antibiotic susceptibility tests that were reported in the literature were in line with a bacterial sensitivity to penicillin and other families of antibiotics, namely aminoglycosides and glycopeptides. Although antibiotic

![Fig. 1. Photography of the extraperitoneal caesarian section. Blue arrow: peritoneal pouch. Yellow arrow: bladder. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)](image-url)
regimens based on the result of susceptibility tests are the mainstay of treatment, fifteen cases (56%), including ours, have reported the need for associated surgical management due to the severity of the abscess in relation to its location, to its size or even its compressive effect –\textsuperscript{3,14,16,18,21,22,24,25}.

The extraperitoneal cesarean section was first described in 1823 by Baudeloque Auguste, and was in fact a vaginotomy carried out by an upper and extraperitoneal route –\textsuperscript{32–34}. It was not until 1909 that W. Lattzko et al. –\textsuperscript{35} described a latero-vesical approach. This operative technique was promoted in the middle of the last century as it offers many advantages in terms of avoiding contamination of the peritoneal cavity with infected amniotic fluid, patient’s comfort and quick post-operative autonomy, making this ambulatory technique an interesting alternative to the classic transperitoneal approach –\textsuperscript{35,36}.

In the mid-1990s, Fauck et al. –\textsuperscript{37} described a new modified extraperitoneal technique that consisted essentially of a paramedian vertical opening of the fascia, a left paravesical extraperitoneal approach of the uterus, and a purse-string closure of the uterine wall, providing good control of bleeding and decrease of the uterine wound length while increasing its thickness. Twenty years later, Ami et al. –\textsuperscript{38} described an innovative extraperitoneal approach to CS that can be used on an ambulatory mode under the name of the French ambulatory cesarean section (FAUCS). Being associated with less need for intravenous painkillers, shorter hospital stays and earlier returns to home, make this ambulatory technique an interesting alternative to the classic technique –\textsuperscript{38,39}.

Several authors –\textsuperscript{38,39} concluded that FAUCS represents a viable alternative to transperitoneal delivery in the presence of uterine

---

**Table 1**

| Author                        | Year | Infection site | Sex | Age | Consumption of unpasteurized milk | Dental history | Immune status | Management                                      |
|-------------------------------|------|----------------|-----|-----|-----------------------------------|----------------|---------------|-------------------------------------------------|
| Slaoui et al. (our case)      | 2022 | Intra-uterine  | F   | 19  | None                              | None           | Pregnancy     | Extraperitoneal cesarean section + antibacterial systemic therapy |
| Ahmed et al. –\textsuperscript{[7]} | 2021 | Brain abscess  | M   | 18  | None                              | None           | Normal        | Mini-cranietomy for drainage + antibacterial systemic therapy |
| Fraggiadakis et al. –\textsuperscript{[8]} | 2017 | Liver abscess  | M   | 46  | None                              | Periodontitis   | Normal        | Percutaneous catheter drainage + antibacterial systemic therapy |
| Azouzi et al. –\textsuperscript{[4]} | 2015 | Intra-uterine  | F   | 32  | None                              | None           | Pregnancy     | Cesarean section + antibacterial systemic therapy |
| Buchelli-Ramirez et al. –\textsuperscript{[9]} | 2013 | Necrotizing pneumonia | M | 70  | Yoghurt                          | None           | Normal        | Antibacterial systemic therapy |
| Hadjisymeou et al. –\textsuperscript{[10]} | 2013 | Neck abscess   | F   | 50  | None                              | None           | Diabetes mellitus | Incision and drainage + antibacterial systemic therapy |
| Feierabend et al. –\textsuperscript{[11]} | 2013 | Brain abscess  | M   | 8   | None                              | None           | Normal        | Drainage by functional endoscopic sinus surgery + antibacterial systemic therapy |
| Inoue et al. –\textsuperscript{[12]} | 2012 | Subdural empyema | M   | 33  | None                              | None           | Normal        | Open surgery for removal and drainage + antibacterial systemic therapy |
| Topçu et al. –\textsuperscript{[13]} | 2011 | Brain abscess  | M   | 1   | Raw milk products                 | None           | Normal        | Cranietomy for drainage + antibacterial systemic therapy |
| Kim et al. –\textsuperscript{[14]} | 2010 | Liver abscess  | M   | 42  | None                              | None           | Normal        | Percutaneous catheter drainage + antibacterial systemic therapy |
| Lin et al. –\textsuperscript{[15]} | 2010 | Endocarditis   | M   | 41  | None                              | None           | Normal        | Antibacterial systemic therapy |
| Davies et al. –\textsuperscript{[16]} | 2010 | Ascending cholangitis | F | 72  | None                              | None           | Normal        | Endoscopic sphincterotomy for drainage + antibacterial systemic therapy |
| Resch et al. –\textsuperscript{[17]} | 2008 | Endocarditis   | M   | 55  | None                              | Dental cars     | Normal        | Antibacterial systemic therapy |
| Mofredj et al. –\textsuperscript{[18]} | 2006 | Purulent pleurisy | M | 66  | None                              | Dental cars     | Normal        | Antibacterial systemic therapy |
| Leung et al. –\textsuperscript{[19]} | 2006 | Canaliculitis  | F   | 80  | None                              | Dental cars     | Diabetes mellitus | Antibacterial systemic therapy |
| Zechini et al. –\textsuperscript{[20]} | 2006 | Endocarditis   | M   | 55  | None                              | Dental surgery   | Normal        | Antibacterial systemic therapy |
| Koyuncun et al. –\textsuperscript{[21]} | 2005 | Deep neck infection | M | 68  | Raw milk products                | Buccal malignancy mucosa tumor | Previous | Incision and drainage + antibacterial systemic therapy |
| Antolin et al. –\textsuperscript{[22]} | 2004 | Liver abscess  | F   | 79  | None                              | None           | Normal        | Percutaneous catheter drainage + antibacterial systemic therapy |
| Halldórsson et al. –\textsuperscript{[23]} | 2002 | Endocarditis   | M   | 67  | None                              | None           | Normal        | Antibacterial systemic therapy |
| Akhaddar et al. –\textsuperscript{[24]} | 2002 | Cerebellar abscess | F | 45  | None                              | Dental surgery   | Normal        | Subccipital cranietomy for drainage + antibacterial systemic therapy |
| Nakarai et al. –\textsuperscript{[25]} | 2000 | Liver abscess  | F   | 14  | None                              | None           | Normal        | Percutaneous catheter drainage + antibacterial systemic therapy |
| Pellizer et al. –\textsuperscript{[26]} | 1996 | Endocarditis   | M   | 56  | None                              | None           | Normal        | Antibacterial systemic therapy |
| Durand et al. –\textsuperscript{[27]} | 1995 | Septicemia     | M   | 69  | Yoghurt                          | None           | Normal        | Antibacterial systemic therapy |
| Campbell et al. –\textsuperscript{[28]} | 1993 | Septic arthritis | F | 57  | None                              | None           | Normal        | Antibacterial systemic therapy |
| Mannion et al. –\textsuperscript{[29]} | 1990 | Endocarditis   | F   | 65  | None                              | None           | Normal        | Antibacterial systemic therapy |
| Torre et al. –\textsuperscript{[30]} | 1990 | Necrotizing pneumonia | M | 24  | None                              | None           | HIV           | Antibacterial systemic therapy |
| Wood et al. –\textsuperscript{[31]} | 1955 | Endocarditis   | M   | 21  | Sour cream                       | Irritated gum surrounding a non-vital tooth | Normal | Antibacterial systemic therapy |
infection, presumed or proven, as in the Azouzi et al. [4] case and ours.

4. Conclusions

Intra-uterine infection predominantly occurs by ascending bacterial invasion from the lower genital tract to the typically sterile amniotic cavity in the setting of membrane rupture. Extraperitoneal cesarean section serves as a viable alternative to classic transperitoneal delivery in the presence of uterine infection by controlling bacterial spread.

Our case serves as a reminder that IUI can arise from multiple pathogens, including Lactococcus lactis cremoris which is known as a harmless bacterium.

This work has been reported in line with the SCARE 2020 criteria [40].

Abbreviations

| Abbreviation | Description |
|--------------|-------------|
| IUI          | intra-uterine infection |
| FHR          | fetal heart rate |
| FAUCS        | French Ambulatory Cesarean Section |
| CS           | Cesarean Section |

Provenance and peer review

Not commissioned, externally peer-reviewed.

Availability of data and materials

Supporting material is available if further analysis is needed.

Funding

There are no funding sources to be declared.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethics approval and consent to participate

Ethics approval has been obtained to proceed with the current study. Written informed consent was obtained from the patient for participation in this publication.

Author contribution

Aziz SLAOUI: study concept and design, data collection, data analysis and interpretation, writing the paper
Imane BENMOUNA: study design, data collection, data interpretation, writing the paper
Najia ZERAIDI: study design, data collection, data interpretation, writing the paper
Amina LAHKDAR: study design, data collection, data interpretation, writing the paper
Aicha GHARBACH: study design, data collection, data interpretation, writing the paper
Aziz BAYDADA: study concept, data collection, data analysis, writing the paper

Research registration

Not applicable.

Guarantor

The corresponding author is the guarantor of submission.

Declaration of competing interest

The authors declare that they have no competing interests.

Acknowledgements

None.

References

[1] G. Beucher, C. Chatfier, C. Cazanave, Diagnosis and management of intra-uterine infection: CNGOF preterm premature rupture of membranes guidelines, Gynecol. Obstet. Fertil. Séméiologie (2018), https://doi.org/10.1016/j.joofs.2018.10.022.
[2] American College of Obstetricians and Gynecologists, Intrapartum management of intraamniotic infection. Committee opinion no. 712, Obstet. Gynecol. 130 (2017) e65–101.
[3] World Health Organisation, WHO recommendations for prevention and treatment of maternal peripartum infections. http://www.who.int/reproductivehealth/publications, 2015.
[4] F. Azouzi, C. Chahed, M. Marzouk, Chorioamnionitis due to Lactococcus lactis cremoris: a case report, Case Rep. Womens Health 7 (2015) 1–2, https://doi.org/10.1016/j.crwnh.2015.07.002. Published 2015 Jul 21.
[5] K.H. Schleifer, J. Kraus, C. Dvorak, R. Kilpper-Balz, M.D. Collins, W. Fischer, Transfer of Streptococcus lactis and related Streptococci to the Genus Lactococcus gen. nov, Syst. Appl. Microbiol. 6 (2) (1985) 183–195, https://doi.org/10.1016/0723-2276(85)80052-7. ISSN0723-2270.
[6] P. Duwat, S. Sourir, B. Cesaldu, G. Lambrecht, K. Vido, P. Gauthu, Y. Le Lort, F. Violet, P. Loubiere, A. Gru, Respiratory capacity of the fermenting bacterium lactococcus lactis and its positive effects on growth and survival, J. Bacteriol. 183 (2001) 4509–4516.
[7] I. Ahmed, K. Aziz, H. Tareen, M.A. Ahmed, Brain abscess caused by lactococcus lactis in a young male, J. Coll. Physicians Surg. Pak. 30 (7) (2021 Jul) 852–854, https://doi.org/10.29271/jcpps.2021.07.852. PMID: 34271791.
[8] K. Fragkiadakis, P. Ioannou, E. Barbouranakis, G. Samonis, Intra-abdominal abscesses by Lactococcus lactis ssp cremoris in an immunocompetent adult with severe periodontitis and pernicious anemia, IDCases 7 (2020) 27–29, https://doi.org/10.1016/j.idcr.2016.12.001. Published 2016 Dec 11.
[9] H.L. Buchelli-Ramirez, C. Alvarez-Alvarez, S. Rojo-Alba, M. Garcia-Clemente, R. Gimadevilla-Suárez, A. Pandol-Sandoval, P. Casan-Clar, Necrotising pneumonia caused by lactococcus lactis cremoris, Int. J. Tuberc. Lung Dis. 17 (4) (2013 Apr) 565–567, https://doi.org/10.5888/ijtld.2013.02.0620. PMID: 23485391.
[10] S. Hadjijaymeou, P. Loizou, P. Kothari, CNGOF preterm premature rupture of membranes guidelines, Gynecol. Obstet. Fertil. Séméiologie (2018), https://doi.org/10.1016/j.joofs.2018.10.022. Published 2018 Dec 1.
[11] D. Feierabend, R. Reichart, B. Romeike, R. Kalff, J. Walter, Cerebral abscess due to lactococcus lactis cremoris in a child after sinusitis, Clin. Neurol. Neurosurg. 115 (2013) 614–616.
[12] M. Inoue, A. Saito, H. Kon, et al., Subdural empyema due to lactococcus lactis cremoris: case report, Neurol. Med. Chir. (Tokyo) 54 (4) (2014) 341–347, https://doi.org/10.2177/nmc.2014-0440.
[13] Y. Topcu, G. Akner, E. Bayram, S. Huz, M. Türkmen, Brain abscess caused by lactococcus lactis cremoris in a child, Eur. J. Pediatr. 170 (2011) 1603–1605.
[14] H.S. Kim, D.W. Park, Y.K. Youn, Y.M. Jo, J.Y. Kim, J.Y. Song, J.W. Sohn, H. J. Cheong, W.J. Kim, M.J. Kim, W.S. Choi, Liver abscess and empyema due to lactococcus lactis cremoris, J. Korean Med. Sci. 25 (2010) 1669–1671.
[15] K.H. Lin, C.L. Sy, C.S. Chen, C.H. Lee, Y.T. Lin, J.Y. Li, Infective endocarditis complicated by intracerebral hemorrhage due to lactococcus lactis subsp. Cremoris, Infection 38 (2010) 147–149.
[16] J. Davies, M.D. Burkitt, A. Watson, Ascending cholangitis presenting with lactococcus lactis cremoris bacteremia: a case report, J. Med. Case Rep. 3 (2009) 5.
[17] M. Rosch, T. Schichtl, D.H. Endemann, D.P. Griese, F. Kasprzak, B. Djavidani, M. Fleck, A. Luchner, G.A. Riegger, General aneurysmatosis due to cheese consumption: complications of an endocarditis caused by lactococcus lactis, J. Cardiol. 126 (2008) e8–e9.
[18] A. Mofredj, S. Beldjoudi, N. Farouj, Purulent pleurisy due to lactococcus cremoris: a case report, Case Rep. Womens Health 7 (2015) 1.
[19] M. Resch, T. Schichtl, D.H. Endemann, D.P. Griese, P. Kasprzak, B. Djavidani, M. Fleck, A. Luchner, G.A. Riegger, General aneurysmatosis due to cheese consumption: complications of an endocarditis caused by lactococcus lactis, J. Korean Med. Sci. 25 (2010) 1669–1671.
[20] M. Fleck, A. Luchner, G.A. Riegger, General aneurysmatosis due to cheese consumption: complications of an endocarditis caused by lactococcus lactis, J. Gastroenterol. 48 (2013) 210–217.
[21] M. Fleck, A. Luchner, G.A. Riegger, General aneurysmatosis due to cheese consumption: complications of an endocarditis caused by lactococcus lactis, J. Gastroenterol. 48 (2013) 210–217.
[22] J. Davies, M.D. Burkitt, A. Watson, Ascending cholangitis presenting with lactococcus lactis cremoris bacteremia: a case report, J. Med. Case Rep. 3 (2009) 5.
[23] H.D. Halldórsson, V. Haraldsdóttir, A. Bodvarsson, G. Thorgerirsson, M. Kristjánsson, Endocarditis caused by lactococcus cremoris, Scand. J. Infect. Dis. 34 (2002) 205–206.
[24] A. Akhaddar, B. El Mostarchid, M. Gazzaz, M. Boucetta, Cerebellar abscess due to Lactococcus lactis. A new pathogen, Acta Neurochir. (Wien) 144 (2002) 305–306.
[25] T. Nakazai, K. Moriya, Y. Nojiri, J. Nei, Y. Kawamori, Liver abscess due to lactococcus lactis cremoris, Pediatr. Int. 42 (2000) 699–701.
[26] G. Pellizzer, P. Benedetti, F. Biavasco, V. Manfrin, M. Franzetti, M. Scagnelli, C. Scarpa, F. de Lalla, Bacterial endocarditis due to lactococcus lactis subsp. Cremoris: case report, Clin. Microbiol. Infect. 2 (1996) 230–232.
[27] J.M. Durand, M.C. Rousseau, J.M. Gandois, J. Nei, J. Soubeyrand, Streptococcus lactis septicemia in a patient with chronic lymphocytic leukemia, Am. J. Hematol. 50 (1995) 64–65.
[28] P. Campbell, S. Dealler, J.O. Lawton, Septic arthritis and unpasteurised milk, J. Clin. Pathol. 46 (1993) 1057–1058.
[29] P.T. Mannion, M.M. Rothburn, Diagnosis of bacterial endocarditis caused by streptococcus lactis and assisted by immunoblotting of serum antibodies, J Infect 21 (1990) 317–318.
[30] D. Torre, C. Sampietro, G.P. Fiori, F. Luzzaro, Necrotizing pneumonitis and empyema caused by streptococcus cremoris from milk, Scand. J. Infect. Dis. 22 (1990) 221–222.
[31] J.F. Wood, K. Jacobs, M. McCarty, Streptococcus lactis isolated from a patient with subacute bacterial endocarditis, Am. J. Med. 18 (1955) 345–347.
[32] A.P. Kourtis, J.S. Read, D.J. Jamieson, Pregnancy and infection, N. Engl. J. Med. 370 (23) (2014) 2211–2218, https://doi.org/10.1056/NEJMra1213566.
[33] R.L. Wallace, G.S. Eglington, M.L. Yonekura, T.M. Wallace, Extraperitoneal cesarean section: a certain form of infection prophylaxis, Am. J. Obstet. Gynecol. 148 (1984) 172–177.
[34] W. Latzko, Uber den extraperitonealen Kaiserschnitt, Zentralbl. Gynakol. 33 (1909) 275.
[35] C.J. Paternite, M.S. Rechand, Extraperitoneal cesarean sections: analysis of 93 consecutive operations, Obstet. Gynecol. 3 (3) (1954) 283–286.
[36] R.L. Wallace, G.S. Eglington, M.L. Yonekura, T.M. Wallace, Extraperitoneal cesarean section: a surgical form of infection prophylaxis? Am. J. Obstet. Gynecol. 148 (2) (1984), 17-7.
[37] D. Fauck, O. Ami, M. Naett, J.H. Ravina, Comparative StudyExtraperitoneal cesarean section (CS) versus vaginal delivery, Int. J. Gynaecol. Obstet. Suppl. (2000).
[38] K. Dimassi, A. Halouani, A. Kammoun, O. Ami, R. Simon, L. Velemir, D. Fauck, A. Triki, The extraperitoneal french Ambulatory cesarean section technique leads to improved pain scores and a faster maternal autonomy compared with the intraperitoneal misgav ladach technique: a prospective randomized controlled trial, PLoS One 16 (1) (2021 Jan 22), e0245645, https://doi.org/10.1371/journal.pone.0245645. PMID: 33481875; PMCID: PMC7822305.
[39] K. Dimassi, O. Ami, D. Fauck, B. Simon, L. Velemir, A. Triki, French ambulatory cesarean: mother and newborn safety, Int. J. Gynaecol. Obstet. 148 (2) (2020 Feb) 198–204, https://doi.org/10.1002/ijgo.13013. Epub 2019 Nov 14 PMID: 31642513.
[40] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.