intravenous treatment is no risk factor for neither acute nor chronic infections [15].

REFERENCES

[1] Zimmerli W. Clinical practice. Vertebral osteomyelitis. N Engl J Med. 2010;362:1022–1029. doi:10.1056/NEJMcp0910753.
[2] Roblot F, Besnier JM, Juhel L, Vidal C, Ragot S, Bastides F, et al. Optimal duration of antibiotic therapy in vertebral osteomyelitis. Semin Arthritis Rheum. 2007;36:269–277. doi:10.1016/j.semarthrit.2006.09.004.
[3] Bernard L, Legout L, Zürcher-Pfund L, Stern R, Rohner P, Peter R, et al. Six weeks of antibiotic treatment is sufficient following surgery for septic arthroplasty. J Infect. 2010;61:125–132. doi:10.1016/j.jinf.2010.05.005.
[4] Roehrborn AA, Hansbrough JF, Gualdoni B, Kim S. Lipid-based slow-release formulation of amikacin sulfate reduces foreign body-associated infections in mice. Antimicrob Agents Chemother. 1995;39:1752–1755.
[5] Viola RW, King HA, Adler SM, Wilson CB. Delayed infection after elective spinal instrumentation and fusion. A retrospective analysis of eight cases. Spine. 1997;22:2444–2450; discussion 2450–2451.
[6] Kowalski TJ, Berbari EF, Huddleston PM, Steckelberg JM, Mandrekar JN, Osmon DR. The management and outcome of spinal implant infections: contemporary retrospective cohort study. Clin Infect Dis. 2007;44:913–920. doi:10.1086/512194.
[7] Mirovsky Y, Floman Y, Smorgick Y, Ashkenazi E, Anekstein Y, Millgram MA, et al. Management of deep wound infection after posterior lumbar interbody fusion with cages. J Spinal Disord Tech. 2007;20:127–131. doi:10.1097/01.bsd.0000211266.66615.e5.
[8] Collins I, Wilson-MacDonald J, Chami G, Burgoyne W, Vineyakam P, Berendt T, et al. The diagnosis and management of infection following instrumented spinal fusion. Eur Spine J. 2008;17:445–450. doi:10.1007/s00586-007-0559-8.
[9] Falavigna A, Righesso O, Traynelis VC, Teles AR, da Silva PG. Effect of deep wound infection following lumbar arthrodesis for degenerative disc disease on long-term outcome: a prospective study: clinical article. J Neurosurg Spine. 2011;15:399–403. doi:10.3171/2011.5.SPINE10825.
[10] Sponseller PD, LaPorte DM, Hungerford MW, Eck K, Bridwell KH, Lenke LG. Deep wound infections after neuromuscular scoliosis surgery: a multicenter study of risk factors and treatment outcomes. Spine. 2000;25:2461–2466.
[11] Chen SH, Lee CH, Huang KC, Hsieh PH, Tsai SY. Postoperative wound infection after posterior spinal instrumentation: analysis of long-term treatment outcomes. Eur Spine J. 2015;24:561–570. doi:10.1007/s00586-014-3636-9.
[12] Chaichana KL, Bydon M, Santiago-Dieppa DR, Hwang L, McLoughlin G, Sciubba DM, et al. Risk of infection following posterior instrumented lumbar fusion for degenerative spine disease in 817 consecutive cases. J Neurosurg Spine. 2014;20:45–52. doi:10.3171/2013.10.SPINE1364.
[13] Maruo K, Berven SH. Outcome and treatment of postoperative spine surgical site infections: predictors of treatment success and failure. J Orthop Sci. 2014;19:398–404. doi:10.1007/s00776-014-0545-z.
[14] Billières J, Uçkay I, Faundez A, Douissard J, Kuczma P, Suvà D, et al. Variables associated with remission in spinal surgical site infections. J Spine Surg. 2016;2:128–134. doi:10.21037/jss.2016.06.06.
[15] Kowalski TJ, Berbari EF, Huddleston PM, Steckelberg JM, Osmon DR. Propionibacterium acnes vertebral osteomyelitis: seek and ye shall find? Clin Orthop Relat Res. 2007;461:25–30. doi:10.1097/BLO.0b013e318073c25d.

Author: Susana Núñez-Pereira

QUESTION 3: Is there a role for chronic antibiotic suppression after treating patients with retained infected spinal hardware?

RECOMMENDATION: The use of chronic antibiotic suppression (CAS) has not been clearly investigated until now. However, it can be an option for patients whose implants cannot be removed or who refuse further surgeries because of comorbidities.

LEVEL OF EVIDENCE: Consensus

DELEGATE VOTE: Agree: 93%, Disagree: 0%, Abstain: 7% (Super Majority, Strong Consensus)

RATIONALE

Only one study has compared patients receiving CAS [1]. They found that 5 out of 22 patients with CAS had treatment failure, compared with 5 out of 6 in the control group. The definition they used for treatment failure was described as the need for an unanticipated debridement or a clinician's decision to give a second course of antibiotics. Suppressive antibiotics were given for a median time of 303 days (IQR 147 to 672) to patients with early onset infection and 410 days (IQR 61 to 667) to patients with late onset infection. Data on treatment failure was reported only for early onset infection patients. It could be argued that patients already under CAS would not have been eligible for a second course of antibiotic treatment and this could partly increase the rates of treatment failure on the group without CAS, biasing the study results.

Other studies reporting on antibiotic treatments show large variations in the duration of treatment. Miyazaki et al. reported a mean duration of oral treatment of 336 days, ranging from 89 to 1,673 days [2]. Their study focused on multi-resistant surgical site infection treated with implant retention. Maruo et al. reported an average duration of antibiotic treatment of 255.8 days with a standard deviation of 283.4 days [3]. All these reports show a huge variation in the length of antibiotic treatment, with a select group of patients in each study receiving CAS. Decision for prolonged CAS was made at the clinician's discretion and based on the patient's symptoms, so there is no particular setting in which it would be possible to offer a sound recommendation. Besides the mentioned paper by Kowalski, there are no reports comparing CAS with other treatment regimes.

REFERENCES

[1] Kowalski TJ, Berbari EF, Huddleston PM, Steckelberg JM, Mandrekar JN, Osmon DR. The management and outcome of spinal implant infections: contemporary retrospective cohort study. Clin Infect Dis. 2007;44(7):913–920.
[2] Miyazaki S, Kakutani K, Maeno K, Takada T, Yurube T, Kurosaka M, Nishida K. Surgical debridement with retention of spinal instrumentation and long-term antimicrobial therapy for multidrug-resistant surgical site infections after spinal surgery: a case series. Int Orthop. 2016;40(6):1171–1177.
[3] Maruo K, Berven SH. Outcome and treatment of postoperative spine surgical site infections: predictors of treatment success and failure. J Orthop Sci. 2014;19(3):398–404.