

Can we prevent splenic rupture for patients with infectious mononucleosis?

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EVIDENCE-BASED ANSWER

All patients with infectious mononucleosis should be considered at risk for splenic rupture since clinical severity, laboratory results, and physical exam are not reliable predictors of rupture (strength of recommendation [SOR]: **B**, case-control study). Clinical evidence indicates that most splenic ruptures occur within 4 weeks of symptom onset,

which correlates with ultrasound data showing resolution of splenomegaly by 30 days from symptom onset (SOR: **B**, case-control study). Given the morbidity and mortality associated with splenic rupture, instruct patients to refrain from vigorous physical activity for 1 month after symptom onset (SOR: **C**, expert opinion).

CLINICAL COMMENTARY

Mononucleosis patients should restrict strenuous activity for 4 weeks from onset

At the University of Arizona student health center, we see over 120 new cases of mononucleosis each year. No clinicians in our group can recall a single splenic rupture in 18 years. The quoted rupture rate of 0.1% based on a study of 8116 patients may be a high estimate and it is likely that most physicians go through their entire career without seeing a single case.

For our group, the value of this review was to point out the lack of correlation with illness severity, lab abnormalities, or a palpable spleen in predicting this rare event. Based on this review, we amended our patient handout to make more specific our advice about restricting strenuous physical activity for 4 weeks from the onset of symptoms.

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■ Evidence summary

The annual incidence of infectious mononucleosis is somewhere between 345 and 671 cases per 100,000 in the US; it is highest in the adolescent age group.¹ Splenic rupture is the leading cause of death in infectious mononucleosis, occurring in 0.1% to 0.2% of all cases.¹⁻⁴ Based on this figure, approximately 100 cases of rupture may occur yearly in the US, only a few of which are reported.

A retrospective analysis of 8116 patients with infectious mononucleosis at the Mayo Clinic estimated the risk of spontaneous splenic rupture to be 0.1% of cases, correlating with rates found in other studies. The study's criteria for definite spontaneous

rupture are: no recent trauma; recent symptoms; hematologic, serologic, and histologic (splenic) evidence of infectious mononucleosis. Five patients with rupture (average age, 22) were identified; 3 were male. Splenectomy was performed for all patients. Follow-up over 33-years found all patients healthy with minimal subsequent illness.³

A review of 55 cases found almost all splenic ruptures occurred between the fourth and twenty-first days of illness, and that all affected spleens were enlarged, although only half were palpable on exam. Ninety percent of the ruptures occurred in males, and more than half were nontraumatic. There was no correlation between severity of illness and suscep-

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FAST TRACK

There was no correlation between severity of illness and susceptibility to splenic rupture

tibility to splenic rupture. No specifics were given on duration of illness or how splenomegaly was diagnosed.⁴

The best technique for identifying splenic enlargement and determining risk of rupture is unclear. In a case-control study, 29 patients were admitted to an ear, nose, and throat department with infectious mononucleosis and were evaluated serially for splenic and hepatic enlargement by ultrasound. Diagnosis was based on clinical picture, a positive heterophile test, and other blood tests. Four patients were included despite negative serology due to compelling clinical presentations and symptoms. Serial ultrasound imaging showed that all had enlarged spleens (mean enlargement 50%–60%); 50% had hepatic enlargement (5%–20% enlargement). The patients were compared with a control group of 8 patients admitted with peritonsillar abscess, as verified by tonsillectomy. No controls had hepatic or splenic enlargement. Physical examinations detected splenomegaly in only 17% of the study patients. The exams were conducted by house staff without blinding, randomization, or tests of reproducibility. Ultrasound scanning was completed on days 1, 3, 5, 10, 20, 90, and 120. The spleen was significantly larger in the infectious mononucleosis group than in the control group for the first 30 days, and no difference in size was found over the subsequent 3 months. No correlation existed between laboratory values and enlargement of the spleen or liver.⁵

No quality studies evaluate the risks of physical activity in infectious mononucleosis. Case reports of rupture have found comparable rates between traumatic and nontraumatic causes. In addition, no clinical trials evaluate imaging in decisions regarding return to activity and its effect on splenic rupture. Ultrasound is often used in the athletic setting for these decisions but no evidence supports its use as routine practice. The routine use of ultrasound for this purpose would cost more than \$1 million to prevent 1 traumatic rupture.⁶

Recommendations from others

Clinical Sports Medicine recommends athletes refrain from sporting activities until all acute symptoms resolve and contact sports avoided while the spleen is enlarged. No recommendation is given on determining spleen size.⁷

Team Physician Handbook recommends athletes do no cardiovascular work, lifting, strength training, or contact sports for 2 weeks because of the risk of splenic rupture. Activity is then gradually increased as the athlete improves. Athletes are to avoid contact or weight-lifting for 4 weeks unless they feel well and ultrasound reveals a normal-sized spleen.⁸

Sports Medicine Secrets advises ultrasound or CT of the spleen to be obtained if there is any suspicion of splenomegaly or if return to play before 4 weeks is contemplated. Light athletic activity may be resumed approximately 3 weeks after symptom onset if the spleen is not tender or enlarged on examination, the patient is afebrile, liver enzymes are normal, and all other complications are resolved. Contact sports may be resumed 4 weeks after symptom onset if there is no documentation of splenomegaly, the athlete feels ready, and all other complications have resolved.⁹

REFERENCES

1. Auwaerter PG. Infectious mononucleosis in middle age. *JAMA* 1999; 281:454–459.
2. Maki DG, Reich RM. Infectious mononucleosis in the athlete. Diagnosis, complications, and management. *Am J Sports Med* 1982; 10:162–173.
3. Farley DR, Zietlow SP, Bannon MP, Farnell MB. Spontaneous rupture of the spleen due to infectious mononucleosis. *Mayo Clin Proc* 1992; 67:846–853.
4. Asgari MM, Begos DG. Spontaneous splenic rupture in infectious mononucleosis: a review. *Yale J Biol Med* 1997; 70:175–182.
5. Dommerby H, Stangerup SE, Stangerup M, Hancke S. Hepatosplenomegaly in infectious mononucleosis assessed by ultrasonic scanning. *J Laryngol Otol* 1986; 100:573–579.
6. Ebell MH. Epstein-Barr virus infectious mononucleosis. *Am Fam Physician* 2004; 70:1279–1287.
7. Brukner P, Khan K. *Clinical Sports Medicine*. 2nd ed, rev. Australia: McGraw-Hill; 2002.
8. Martin TJ. Infections in athletes. In: Mellion MB et al, eds. *Team Physician's Handbook*. 3rd ed. Philadelphia, Pa: Hanley & Belfus; 2001:226–228.
9. Grindel SH, Shea MA. Infections in athletes. In: Mellion MB, Putukian M, Madden CC, eds. *Sports Medicine Secrets*. 3rd ed. Philadelphia, Pa: Hanley & Belfus; 2003:207.

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